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1987-1988
Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

National Machine Tool Builders' Association
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FOREWORD

For the U.S. machine tool industry 1986 and the first half of 1987 were troubling but eventful. Shipments of new machine tools by U.S. builders in 1986 were up slightly from 1985, to stand at just under $2.7 billion for the year. This was well below the $5.1 billion registered in 1981 and is evidence of the continuing economic problems of the industry. Net new orders for machine tools, the barometer of industry's demand for new productive equipment, unlike shipments, showed a net decline for the year. Standing at $2.1 billion, 1986 orders were 16% below their 1985 levels and at their lowest point since the recession of 1982-83. Putting this into perspective, 1986 orders were less than 40% of the record $5.6 billion in orders registered in 1979.

What is especially troubling is that the machine tool industry has failed to share in the economic expansion that has taken place in the U.S. since 1983. While the economy as a whole has forged ahead with uninterrupted real economic growth since the beginning of 1983, and the Dow-Jones has surged to new record highs, the machine tool industry has continued to struggle. This has been the case in the first half of 1987 as the industry's order total was about 19% below the total of the same period in 1986. Shipments, as a result of the poor 1986 order year, were also off 19% for the first half of 1987.

In contrast to the domestic machine tool industry's problems, the onslaught of imports into the U.S. market continued virtually unabated in 1986. While domestic machine tool builders' orders fell during 1986, imports of foreign machine tools rose by just under 30% for the year. This brought the total value of foreign machine tools sold in the U.S. to $2.25 billion, the highest level ever recorded. As a result of this surge the import share of the U.S. machine tool market rose to just under 50% for the year, another record high in import share.

In recognition of the problem that the increase in imports represents for America's national security, the Reagan administration in late 1986 instituted a program of actions designed to help restore the competitiveness of America's machine tool industry. Key features of the program include federal support of machine tool research efforts in the private and government sectors, approval of industry initiated export promotion programs, and the negotiation of voluntary export restraints with Japan and Taiwan in certain categories of machine tools. These two nations are the major import sources of the machinery covered in the trade restraints. The industry has hailed the institution of the government's program as a long overdue recognition of the vital role that machine tools play in the maintenance of the nation's industrial and defense strength.

As we look forward to the rest of 1987 and into 1988 we are concerned that America's manufacturers are not moving rapidly enough to acquire the new, productivity-enhancing capital equipment that they need to reestablish themselves as world class competitors. While the general economic outlook continues to be favorable, the capital spending plans of the major metalworking industries are not keeping pace with the economy's momentum. The latest Department of Commerce capital spending surveys indicate that the machine tool industry's major customers all expect their 1987 capital spending to be below 1986 levels.

We find this failure to aggressively invest troubling. If American industry is to maintain its preeminent role as a creator of wealth for the nation, and its place as the force that drives

the service sector of the economy, it must continually revitalize its productive base of human and physical capital. Failure to do so dooms not only our manufacturing base, but ultimately the entire economic fabric upon which our national wealth and security is based. The leaders of industry, labor and government must realize that it is time to take a longer run perspective. Short term objectives must be replaced by a long term strategic view.

A recognition of the need to invest in new capital equipment is but one part of the need to restructure the nation's perspective. In the post-World War II era the United States has undergone a dramatic shift in its economy away from agriculture and manufacturing toward service industries. This has placed a responsibility on each farmer to produce more food to feed our expanding population and has placed an equivalent burden on each industrial employee to produce an ever larger volume of manufactured goods for each member of our society.

Just as mechanization was the answer to the problem of farm productivity, the new generation of industrial technology is part of the answer to the problem of manufacturing productivity. The machine tool industry is meeting the challenge of providing its customers the equipment that will enable each manufacturing employee to produce more of the goods that the market demands. We look forward to the prospect of continuing in partnership with American industry in the development of the world's most modern, productive manufacturing economy.

The 19th edition of the Economic Handbook again offers industry executives, market researchers, legislators, administrators and students an expanded collection of data on the economy and the machine tool industry.

Wide fluctuations in currency values and varied definitions for different time periods account for occasional differences in the data for what appear to be identical subjects in the Handook. As much as possible, these differences are explained in the chapter introductions, footnotes and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

James A Gray

James A. Gray
President

September 25, 1987

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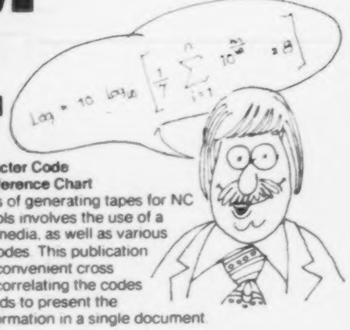
TECHNICALLY SPEAKING...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NMTBA offers a series of nine technical publications that contain suggestions, guidelines and information to make your company's operation more efficient and productive.

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1 Guidelines for the Measurement of Machine Tool Utilization
This publication suggests a uniform procedure for the measurement and reporting of machine tool utilization. It provides a system to measure the effectiveness of a wide variety of machines and their related resources. It establishes indices of production, availability, utilization and consistent methods for their evaluation.

2 Noise Measurement Techniques
This publication suggests the most recent measuring techniques and procedures for the determination of machine tool sound. A discussion of time-weighted average sound levels is included, as well as a discussion of the disagreement between OSHA and EPA as to the basis for computing noise dosage.

3 Definition and Evaluation of Accuracy and Repeatability of NC Machine Tools
This publication was prepared to help develop a better understanding of the accuracy and repeatability of numerically controlled machine tools. Definitions, methods of computation and testing procedures are thoroughly discussed. This paper is recognized in the COCOM (Coordinating Committee) Regulations which govern the export licensing of NC machine tools.

4 Common Words As They Relate to NC Software
The aim of this publication is to improve communication among those involved with NC computer software. It defines the common terms used throughout the industry including those regarding the preparation and use of computer software for numerically controlled machine tools.

5 NC Character Code Cross Reference Chart
The process of generating tapes for NC machine tools involves the use of a number of media, as well as various character codes. This publication provides a convenient cross reference, correlating the codes and standards to present the needed information in a single document.

6 Standards Index
A bibliography of standards pertinent to the design, manufacture, sale and use of machine tools.

7 Selecting an Appropriate NC Programming Method
Selecting the best NC programming method for a particular set of manufacturing circumstances is an important decision for new and established NC shops alike. The implications of this decision are manifold and an incorrect decision can adversely affect the expected return on high cost capital equipment. This publication explains the elements of manual and computer-aided programming and will help you in selecting the right method for your shop.

8 NC is EZ
This publication is intended as a practical and easy to understand NC primer. It will help prospective first-time NC users plan and execute the installation and start-up of new equipment with a minimum of difficulty.

9 NC Part Programming Profile and Summary Report
This survey and summary report provides data useful to companies to compare their own NC programming efforts with other shops having a similar number of NC machines. It puts in proper perspective the NC programming effort required at shops considering acquisitions – perhaps first-time – of machine tools.

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NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist were it not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 220 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metalcutting machine tools shipments made up only slightly more than 10 cents of every $100 in goods and services produced. In 1986, shipments of complete machine tools made up just over 6 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. Business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included is a capacity utilization series for selected machine tool consuming industries as published by the McGraw-Hill Publications Company.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly since the 1950s. Investment apparently has not kept up with the need to replace aging capital assets in U.S. metalworking industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes are limited in their ability to make adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

U.S. machine tool builders have traditionally been active exporters of their products. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. However, a surge in imports in the late 1970's, sparked by unprecedented peacetime machine tool demand, led to the development of a sizable balance of trade deficit. What is troubling is that the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the 1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS
1958 to Date

Year	GNP(r) Billion $	Shipments in Billion Dollars			Shipments in Million Dollars		
		All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry	Machine Tool Products	Complete Machine Tools
1958	$ 456.8	$ 327.0	$ 162.8	$ 23.4	$ 998	$ 870	$ 591
1959	495.8	363.4	187.3	26.6	1,112	975	616
1960	515.3	370.5	190.6	26.8	1,266	1,126	744
1961	533.8	371.1	187.4	26.6	1,242	1,102	751
1962	574.6	400.3	207.1	29.2	1,430	1,223	821
1963	606.9	420.7	219.4	31.0	1,502	1,370	896
1964	649.8	448.0	235.6	35.3	1,791	1,650	1,164
1965	705.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	772.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	816.4	567.8	303.2	49.2	2,841	2,585	1,806
1968	892.7	603.2	332.4	51.0	2,817	2,500	1,727
1969	963.9	642.5	353.7	56.1	2,835	2,507	1,598
1970	1,015.5	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,102.7	671.1	359.7	56.0	2,019	1,698	998
1972	1,212.8	756.3	408.3	65.8	2,112	1,929	1,019
1973	1,359.3	875.2	476.2	77.8	2,777	2,596	1,501
1974	1,472.8	1,017.5	530.7	92.5	3,580	3,189	2,031
1975	1,598.4	1,039.1	523.9	95.8	3,834	3,432	2,452
1976	1,782.8	1,185.6	608.3	105.5	3,567	3,197	2,060
1977	1,990.5	1,358.4	711.2	122.2	3,943	3,675	2,281
1978	2,249.7	1,522.9	814.2	143.2	4,978	4,735	3,013
1979	2,508.2	1,727.2	912.7	166.5	6,053	5,762	3,877
1980	2,732.0	1,852.7	930.6	180.7	6,981	6,702	4,692
1981	2,052.6	2,017.5	1,006.5	201.5	7,481	7,206	5,096
1982(r)	3,166.0	1,960.2	952.2	187.9	5,840	5,539	3,604
1983(r)	3,401.6	2,054.9	1,019.5	179.0	4,023	3,664	1,845
1984(r)	3,774.7	2,254.4	1,159.5	210.4	4,520	4,178	2,286
1985(r)	3,998.1	2,279.1	1,187.2	215.1	4,790	4,353	2,545
1986(p)	4,206.1	2,273.3	1,201.7	205.8	NA	NA	2,579

NA - Not Available.   p - Preliminary.   r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1979" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S, Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1982 1986" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufactures," M (AS)-1 & 2 and 1982 "Census of Manufactures," Col. 7: National Machine Tool Builders' Association, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments originating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, with values greater than $2,500 per unit including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS

Indexes, 1958 to Date

1967 = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1958	56.0	58.6	53.7	47.6	35.1	33.7	32.7
1959	60.7	65.1	61.8	54.1	39.1	37.7	34.1
1960	63.1	66.4	62.9	54.5	44.6	43.6	41.2
1961	65.4	66.5	61.8	54.1	43.7	42.6	41.6
1962	70.4	71.8	68.3	59.3	50.3	47.3	45.5
1963	74.4	75.4	72.4	63.0	52.9	53.0	49.6
1964	79.6	80.3	77.7	71.7	63.0	63.8	64.5
1965	86.4	88.2	88.0	80.3	74.2	75.6	79.0
1966	94.6	96.5	97.6	95.3	89.9	89.7	93.3
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	109.3	108.1	109.6	103.7	99.2	96.7	95.6
1969	118.1	115.2	116.7	114.0	99.8	97.0	88.5
1970	124.4	113.7	111.7	114.8	91.4	88.1	79.9
1971	135.1	120.3	118.6	113.8	71.1	65.7	55.3
1972	148.6	135.6	134.7	133.7	74.3	74.6	53.4
1973	166.5	156.9	157.1	158.1	97.7	100.4	83.1
1974	180.4	182.4	175.0	188.0	126.0	123.4	112.5
1975	195.8	186.3	172.8	194.7	135.0	132.8	135.8
1976	218.4	212.5	200.6	214.4	125.6	123.7	114.1
1977	243.8	243.5	234.6	248.4	138.8	142.2	126.3
1978	275.6	273.0	268.5	291.1	175.2	183.2	166.8
1979	307.2	309.6	301.0	338.4	213.1	227.9	214.7
1980	334.6	332.1	306.9	367.5	245.7	259.3	259.8
1981	373.9	361.7	332.0	409.6	263.3	278.8	282.2
1982(r)	387.8	351.4	314.1	381.9	205.6	214.3	199.6
1983(r)	416.7	368.4	336.2	363.8	141.6	141.7	102.2
1984(r)	462.4	404.2	382.4	427.6	159.1	161.6	126.6
1985(r)	489.7	408.6	391.6	437.2	168.6	168.4	140.9
1986(p)	515.2	407.5	396.3	418.3	NA	NA	142.8

NA - Not Available. p - Preliminary. r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1964 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Good and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1964	$ 649.8	$ 409.3	$ 99.6	$ 10.9	$130.0
1965	705.1	440.7	116.2	9.7	138.6
1966	772.0	477.3	128.6	7.5	158.6
1967	816.4	503.6	125.7	7.4	179.7
1968	892.7	552.5	137.0	5.5	197.7
1969	963.9	597.9	153.2	5.6	207.3
1970	1,015.5	640.0	148.8	8.5	218.2
1971	1,102.7	691.6	172.5	6.3	232.4
1972	1,212.8	757.6	202.0	3.2	250.0
1973	1,359.3	837.2	238.8	16.8	266.5
1974	1,472.8	916.5	240.8	16.3	299.1
1975	1,598.4	1,012.8	219.6	31.1	335.0
1976	1,782.8	1,129.3	277.7	18.8	356.9
1977	1,990.5	1,257.2	344.1	1.9	387.3
1978	2,249.7	1,403.5	416.8	4.1	425.2
1979	2,508.2	1,566.8	454.8	18.8	467.8
1980	2,732.0	1,732.6	437.0	32.1	530.3
1981	3,052.6	1,915.1	515.5	33.9	588.1
1982	3,166.0	2,050.7	447.3	26.3	641.7
1983	3,401.6	2,229.3	501.9	-5.3	675.7
1984(r)	3,774.7	2,423.0	674.0	-59.2	736.8
1985(r)	3,998.1	2,600.5	661.1	-78.9	815.4
1986	4,206.1	2,762.5	683.6	-104.3	864.2
In constant 1982 dollars (billions)					
1964	$1,973.3	$1,170.6	$325.9	$ 5.9	$470.8
1965	2,087.6	1,236.4	367.0	-2.7	487.0
1966	2,208.3	1,298.9	390.5	-13.7	532.6
1967	2,271.4	1,337.7	374.4	-16.9	576.2
1968	2,365.6	1,405.9	391.8	-29.7	597.6
1969	2,423.3	1,456.7	410.3	-34.9	591.2
1970	2,416.2	1,492.0	381.5	-30.0	572.6
1971	2,484.8	1,538.8	419.3	-39.8	566.5
1972	2,608.5	1,621.9	465.4	-49.4	570.7
1973	2,744.1	1,689.6	520.8	31.5	565.3
1974	2,729.3	1,674.0	481.3	0.8	573.2
1975	2,269.0	1,711.9	383.3	18.9	580.9
1976	2,826.7	1,803.9	453.5	-11.0	580.3
1977	2,958.6	1,883.8	521.3	-35.5	589.1
1978	3,115.2	1,961.0	576.9	-26.8	604.6
1979	3,192.4	2,004.4	575.2	3.6	609.1
1980	3,187.1	2,000.4	509.3	57.0	620.5
1981	3,248.8	2,024.2	545.5	49.4	629.7
1982	3,166.0	2,050.7	447.3	26.3	641.7
1983	3,277.7	2,145.9	503.4	-19.4	647.8
1984	3,492.0	2,239.9	661.3	-85.0	675.9
1985(r)	3,585.2	2,324.5	647.7	-108.2	721.2
1986	3,674.9	2,418.7	657.2	-147.8	746.8

r - Revised.

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

		Actual			Projection
	Measure	1984	1985	1986(r)	1987
Gross National Product	Bil. $	$3,774.7	$3,998.1	$4,206.1	$4,435.0
GNP in Constant Dollars	Bil. 1982 $	3,492.0	3,570.0	3,674.9	3,766.6
GNP Implicit Price Deflator	1982 = 100	108.1	111.7	114.4	117.6
Industrial Production	1977 = 100	121.8	124.5	125.1	128.5
Unemployment Rate	Percent	7.5%	7.2%	7.0%	6.8%
Corporate Profits After Taxes	Bil. $	$ 144.0	$ 140.2	$ 134.0	$ 147.9
Non-Residential Fixed Investment	Bil. 1982 $	430.3	472.0	456.7	454.0
Change in Business Inventories	Bil. 1982 $	62.6	5.7	6.5	16.0
Personal Consumption Expenditures	Bil. 1982 $	2,239.9	2,313.0	2,418.7	2,471.5
Federal Government Purchases	Bil. 1982 $	292.5	322.6	332.2	347.0

r - Revised.

Sources: Actual: U.S. Department of Commerce, "Survey of Current Business" (monthly). Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters, "Economic Outlook USA, Spring 1987."

SELECTED PRICE DEFLATORS
1966 to Date

	Price Deflators			
Year	Gross National Product	Personal Consumption Expenditure	Producers' Durable Equipment	Metal-Working Machinery & Equipment
	1982 = 100			
1966	35.0	36.7	37.2	30.0
1967	35.9	37.6	38.4	31.2
1968	37.7	39.3	39.9	32.4
1969	39.8	41.0	41.5	33.6
1970	42.0	42.9	43.2	35.6
1971	44.4	44.9	45.5	36.6
1972	46.5	46.7	46.8	37.5
1973	49.5	49.6	47.3	39.1
1974	54.0	54.8	51.1	45.8
1975	59.3	59.2	59.7	53.5
1976	63.1	62.6	64.4	56.9
1977	67.3	66.7	68.3	61.9
1978	72.2	71.6	73.3	67.6
1979	78.6	78.2	78.6	75.2
1980	85.7	86.6	86.0	85.5
1981	94.0	94.6	93.7	93.9
1982	100.0	100.0	100.0	100.0
1983	103.8	103.9	99.9	101.7
1984	108.1	108.2	99.5	104.1
1985(r)	112.3	112.4	103.1	106.5
1986	115.4	115.2	104.7	108.4

r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators:" Metal-Working Machinery and Equipment values are "Producer Price Indices."

Source: U.S. Department of Commerce, "Business Statistics," 1979; "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1945 to Date (r)
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1945	$ 213.4	$ 53.4	25.0%	$ 42.7	20.0%	$ 11.6	5.4%
1950	288.3	69.4	24.1	50.4	17.5	21.3	7.4
1955	405.9	101.6	25.0	73.1	18.0	31.7	7.8
1960	515.3	140.4	27.2	96.9	18.8	50.0	9.7
1965	705.1	190.2	27.0	125.8	17.8	75.5	10.7
1970	1,015.5	306.8	30.2	195.4	19.2	135.8	13.4
1974	1,472.8	463.1	31.4	293.9	20.0	213.1	14.5
1975	1,598.4	480.0	30.0	294.9	18.4	239.6	15.0
1976	1,782.8	549.1	30.8	340.1	19.1	270.1	15.2
1977	1,990.5	616.6	31.0	384.1	19.3	300.1	15.1
1978	2,249.7	694.4	30.9	441.4	19.6	330.3	14.7
1979	2,508.2	779.8	31.1	505.0	20.1	355.3	14.2
1980	2,732.0	855.1	31.3	553.8	20.3	390.0	14.3
1981	3,052.6	977.2	32.0	639.5	20.9	425.6	13.9
1982	3,166.0	1,000.8	31.6	635.3	20.1	449.4	14.2
1983	3,401.6	1,061.3	31.2	659.9	19.4	487.7	14.3
1984	3,774.7	1,173.7	31.1	726.5	19.2	540.8	14.3
1985	3,998.1	1,265.4	31.7	786.8	19.7	577.5	14.4
1986(p)	4,206.1	1,341.0	31.9	826.2	19.6	618.8	14.7

p - Preliminary. r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," January 1987, and earlier editions. U.S. Department of Commerce, "Survey of Current Business" (monthly).

CORPORATE PROFITS AND TAX
Selected Years, 1945 to Date
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1945	$ 19.8	$ 10.7	$ 9.1	$ 4.6	$ 4.5
1950	42.9	17.9	25.0	8.8	16.2
1955	49.2	22.0	27.2	10.3	16.9
1960	49.9	22.7	27.2	12.9	14.3
1965	77.4	30.9	46.5	19.1	27.4
1970	76.0	34.4	41.7	22.5	19.2
1974	138.9	51.8	87.1	29.7	57.3
1975	134.8	50.9	83.9	29.6	54.3
1976	170.3	64.2	106.0	34.6	71.4
1977	200.4	73.0	127.4	87.9	87.9
1978	233.5	83.5	150.0	44.7	105.2
1979	257.2	88.0	169.2	50.1	119.1
1980	237.1	84.8	152.3	54.7	97.6
1981	226.5	81.1	145.4	63.6	81.8
1982	169.6	63.1	106.5	66.9	39.6
1983	205.0	75.2	129.8	70.8	59.0
1984	237.6	93.6	144.0	78.1	65.9
1985(r)	223.2	91.8	131.4	81.6	49.8
1986	237.5	103.5	134.0	87.8	46.2

r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1930 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (−)	Year	Receipts	Outlay	Surplus or Deficit (−)
1930	$ 4.1	$ 3.3	$ 0.7	1960	$ 92.5	$ 92.2	$ 0.3
1931	3.1	3.6	−0.5	1961	94.4	97.7	−3.3
1932	1.9	4.7	−2.7	1962	99.7	106.8	−7.1
1933	2.0	4.6	−2.6	1963	106.6	111.3	−4.8
1934	3.0	6.6	−3.6	1964(r)	112.6	118.5	−5.9
1935	3.7	6.5	−2.8	1965	116.8	118.2	−1.4
1936	4.0	8.4	−4.4	1966(r)	130.8	134.5	−3.7
1937	5.0	7.7	−2.8	1967	148.8	157.5	−8.6
1938	5.6	6.8	−1.2	1968	153.0	178.1	−25.2
1939	6.3	9.1	−2.8	1969	186.9	183.6	3.2
1940	6.5	9.5	−2.9	1970	192.8	195.6	−2.8
1941	8.7	13.7	−4.9	1971	187.1	210.2	−23.0
1942	14.6	35.1	−20.5	1972(r)	207.3	230.7	−23.4
1943	24.0	78.6	−54.6	1973	230.8	245.7	−14.9
1944	43.7	91.3	−47.6	1974	263.2	269.4	−6.1
1945	45.2	92.7	−47.6	1975	279.1	332.3	−53.2
1946	39.3	55.2	−15.9	1976	298.1	371.8	−73.7
1947	38.5	34.5	4.0	Tr. Qtr.	81.2	96.0	−14.7
1948	41.6	29.8	11.8	1977	355.6	409.2	−53.6
1949	39.4	38.8	0.6	1978	399.6	458.7	−59.2
1950	39.4	42.6	−3.1	1979	463.3	503.5	−40.2
1951	51.6	45.5	6.1	1980	517.1	590.9	−73.8
1952	66.2	67.7	−1.5	1981	599.3	678.2	−78.9
1953	69.6	76.1	−6.5	1982	617.8	745.7	−127.9
1954	69.7	70.9	−1.2	1983	600.6	808.3	−207.8
1955	65.5	68.4	−3.0	1984	666.5	851.8	−185.3
1956	74.6	70.6	3.9	1985	734.1	946.3	−212.3
1957	80.0	76.6	3.4	1986(r)	769.1	989.8	−220.7
1958	79.6	82.4	−2.8	1987E	842.4	1,015.6	−173.2
1959	79.2	92.1	−12.8	1988E	916.6	1,024.3	−107.8

E - Estimate. r - Revised.

Tr. Qtr.-Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: "Economic Report of the President," January 1987 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT
1959 to Date
(Values in Billions of Current Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1959	$ 495.8	$ 46.3	9.3%	$ 28.3	5.7%
1960	515.3	48.8	9.5	29.7	5.8
1961	533.8	48.3	9.0	28.9	5.4
1962	574.6	52.5	9.1	32.1	5.6
1963	606.9	55.2	9.1	34.4	5.7
1964	649.8	61.4	9.4	38.7	6.0
1965	705.1	73.1	10.4	45.8	6.5
1966	772.0	83.5	10.8	53.0	6.9
1967	816.4	84.4	10.3	53.7	6.6
1968	892.7	91.4	10.2	58.5	6.6
1969	963.9	102.3	10.6	65.2	6.8
1970	1,015.5	105.2	10.4	66.1	6.5
1971	1,102.7	109.6	9.9	68.7	6.2
1972	1,212.8	123.0	10.1	78.5	6.5
1973	1,359.3	145.9	10.7	94.5	7.0
1974	1,472.8	160.6	10.9	103.6	7.0
1975	1,598.4	162.9	10.2	106.6	6.7
1976	1,782.8	180.0	10.1	119.9	6.7
1977	1,990.5	214.2	10.8	147.4	7.4
1978	2,249.7	259.0	11.5	178.0	7.9
1979	2,508.2	302.8	12.1	203.3	8.1
1980	2,732.0	322.8	11.8	208.9	7.6
1981	3,052.6	369.2	12.1	230.7	7.6
1982	3,166.0	366.7	11.6	223.4	7.1
1983	3,401.6	356.3	10.5	230.2	6.8
1984	3,774.7	427.9	11.3	280.2	7.4
1985(r)	3,998.1	458.2	11.5	303.4	7.6
1986	4,206.1	460.0	10.9	316.7	7.5

r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchases of automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT

1948 to Date

(Values in Billions of 1982 Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1948	$1,108.7	$127.4	11.5%	$ 76.9	6.9%
1949	1,109.0	114.8	10.4	65.5	5.9
1950	1,203.7	124.0	10.3	71.2	5.9
1951	1,328.2	131.7	9.9	75.2	5.7
1952	1,380.0	130.6	9.5	73.3	5.3
1953	1,435.3	140.1	9.8	77.7	5.4
1954	1,416.2	137.5	9.7	72.7	5.1
1955	1,494.9	151.0	10.1	81.7	5.5
1956	1,525.6	160.4	10.5	84.9	5.6
1957	1,551.1	161.1	10.4	85.9	5.5
1958	1,539.2	143.9	9.3	73.3	4.8
1959	1,629.1	153.6	9.4	81.7	5.0
1960	1,665.3	159.4	9.6	83.3	5.0
1961	1,708.7	158.2	9.3	80.5	4.7
1962	1,799.4	170.2	9.5	88.9	4.9
1963	1,873.3	176.6	9.4	95.1	5.1
1964	1,973.3	194.9	9.9	107.0	5.4
1965	2,087.6	227.6	10.9	125.8	6.0
1966	2,208.3	250.4	11.3	142.4	6.4
1967	2,271.4	245.0	10.8	139.6	6.1
1968	2,365.6	254.5	10.8	146.5	6.2
1969	2,423.3	269.7	11.1	156.8	6.5
1970	2,416.2	264.0	10.9	152.9	6.3
1971	2,484.8	258.4	10.4	151.0	6.1
1972	2,608.5	277.0	10.6	167.5	6.4
1973	2,744.1	317.3	11.6	199.6	7.3
1974	2,729.3	317.8	11.6	202.7	7.4
1975	2,695.9	281.2	10.4	178.4	6.6
1976	2,826.7	290.6	10.3	186.2	6.6
1977	2,958.6	324.0	11.0	215.7	7.3
1978	3,115.2	362.1	11.6	242.8	7.8
1979	3,192.4	389.4	12.2	258.8	8.1
1980	3,187.1	379.2	11.9	243.0	7.6
1981	3,248.8	395.2	12.2	246.4	7.6
1982	3,166.0	366.7	11.6	223.4	7.1
1983	3,277.7	360.1	11.0	230.5	7.0
1984	3,492.0	430.3	12.3	281.6	8.1
1985(r)	3,585.2	461.4	12.9	309.2	8.6
1986	3,674.9	456.7	12.4	322.1	8.8

r - Revised.

Sources: U.S. Department of Commerce, "Business Statistics, 1982;" and "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
1966 to Date

Year	All Merchandise Billions of Dollars			Machine Tools and Parts Millions of Dollars		
	Exports	Imports	Net Balance	Exports	Imports	Net Balance
1966	$ 29.3	$ 25.5	$ 3.8	$ 273.6	$ 137.4	$ 136.2
1967	30.7	26.9	3.8	294.5	203.7	90.8
1968	33.6	33.0	0.6	286.0	191.3	94.7
1969	36.4	35.8	0.6	323.5	182.5	140.9
1970	42.0	39.8	2.2	403.9	158.5	245.4
1971	42.8	45.5	-2.7	351.0	109.6	241.4
1972	48.8	55.8	-7.0	332.1	141.8	190.3
1973	71.4	70.4	1.0	443.0	211.6	231.4
1974	98.3	103.7	-5.4	566.5	330.3	236.2
1975	107.1	98.0	9.1	705.9	382.4	323.5
1976	114.4	123.4	-9.0	682.8	383.3	299.5
1977	119.7	150.2	-30.5	579.6	482.2	97.4
1978	140.9	174.5	-33.6	738.6	832.4	-93.7
1979	179.2	209.4	-30.2	878.6	1,269.5	-390.9
1980	220.1	244.2	-24.1	1,099.2	1,556.9	-457.7
1981	232.7	261.1	-28.4	1,445.6	1,712.9	-267.3
1982	214.0	249.5	-35.5	1,002.4	1,489.4	-487.0
1983	207.2	282.3	-75.1	691.9	1,100.2	-408.3
1984	222.5	352.1	-129.6	734.9	1,652.7	-917.8
1985(r)	219.6	341.7	-122.1	772.3	2,110.2	-1,337.9
1986	220.2	368.4	-148.2	908.1	2,683.0	-1,774.9

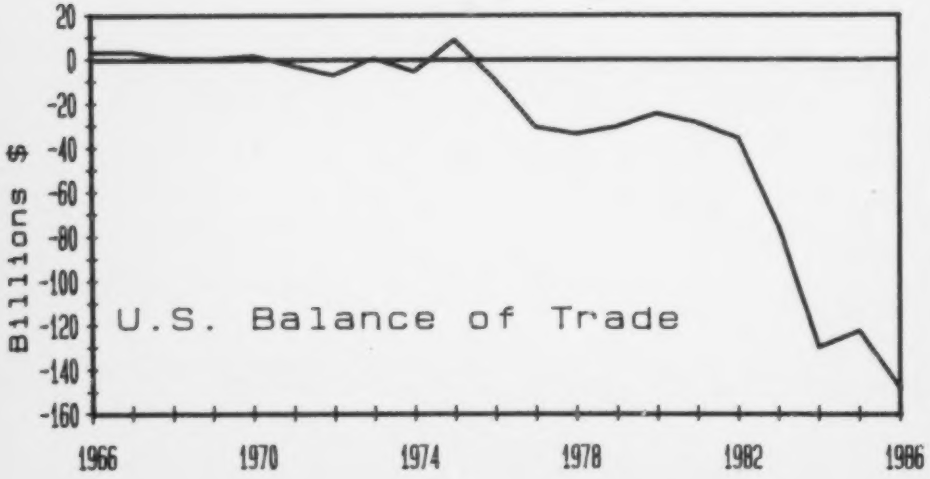
r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source: All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly); Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146."

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS (r)

Book Value at Year End, 1981 to 1986

(Millions of U.S. Dollars)

	1981	1982	1983	1984	1985	1986(p)
World:						
Total All Industries	$228,348	$207,752	$207,203	$212,994	$229,748	$259,890
Manufacturing	92,388	83,452	82.907	85,253	95,104	107,241
Canada:						
Total All Industries	47,073	43,511	44,339	46,830	47,106	50,178
Manufacturing	19,818	18,825	19,209	20,879	21,848	23,759
United Kingdom:						
Total All Industries	30,316	27,537	27,637	28,635	32,601	34,990
Manufacturing	13,087	10,704	10,920	10,383	12,777	13,990
European Economic Community:						
Total All Industries	50,427	44,175	42,573	41,053	48,536	61,236
Manufacturing	28,117	23,588	23,605	23,657	29,157	36,021
Other Western Europe:						
Total All Industries	20,858	20,737	21,968	22,329	24,034	26,958
Manufacturing	4,065	3,528	3,413	3,272	3,761	4,114
Japan:						
Total All Industries	6,762	6,407	7,661	7,920	9,246	11,333
Manufacturing	3,233	3,058	3,915	3,942	4,593	5,305
Australia, New Zealand, & South Africa:						
Total All Industries	12,003	12,014	11,558	10,694	10,146	10,015
Manufacturing	4,703	4,434	4,284	4,270	3,770	3,972
Latin America:						
Total All Industries	38,838	28,161	24,133	25,229	27,901	34,970
Manufacturing	15,809	15,789	13,995	14,566	14,760	15,193
Other Areas:						
Total All Industries	22,072	25,211	27,334	30,304	29,978	30,210
Manufacturing	3,556	3,526	3,565	4,282	4,437	4,886

p – Preliminary. r – Revised.

Source: U.S. Department of Commerce, "Survey of Current Business," (August).

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and capital movements between U.S. corporations and their foreign affiliates.

ESTIMATES OF CAPITAL EXPENDITURES*
BY MAJORITY – OWNED FOREIGN AFFILIATES OF U.S. COMPANIES
BY SELECTED COUNTRY OR AREA, 1980 – 1987

(Millions of U.S. Dollars)

	Actual						Projection	
	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987
WORLD								
Total Manufacturing	$19,540	$19,164	$16,755	$13,724	$14,048	$14,923	$16,908	$17,966
Mchy., Except Elec.	5,589	5,106	4,900	3,778	3,206	3,016	2,968	3,300
CANADA								
Total Manufacturing	3,728	3,800	2,740	2,590	2,702	2,926	3,522	3,335
Mchy., Except Elec.	499	649	601	413	295	223	225	260
LATIN AMERICA								
Total Manufacturing	2,760	3,114	2,703	1,744	1,909	2,026	2,170	2,408
Mchy., Except Elec.	411	422	369	227	319	356	294	387
EUROPE								
Total Manufacturing	11,127	10,273	9,274	7,824	7,619	7,900	9,154	9,939
Mchy., Except Elec.	4,099	3,423	3,249	2,844	2,247	1,837	2,011	2,121
UNITED KINGDOM								
Total Manufacturing	3,005	2,591	2,529	2,113	2,107	2,213	2,394	2,557
Mchy., Except Elec.	784	735	635	600	465	454	458	426
FRANCE								
Total Manufacturing	1,582	1,316	1,323	1,241	1,232	1,010	1,271	1,398
Mchy., Except Elec.	977	821	868	798	746	469	552	511
FEDERAL REP. OF GERMANY								
Total Manufacturing	3,233	2,653	2,306	2,180	2,163	2,371	2,843	2,778
Mchy., Except Elec.	1,174	959	894	723	577	450	550	675
ITALY								
Total Manufacturing	870	797	696	639	504	595	578	702
Mchy., Except Elec.	D	D	D	350	208	209	199	234
ASIA AND PACIFIC								
Total Manufacturing	1,281	1,237	1,327	1,004	1,265	1,358	1,287	1,386
Mchy., Except Elec.	34(a)	47(a)	57(a)	58(a)	317	74(a)	78(a)	67(a)
JAPAN								
Total Manufacturing	707	666	765	463	551	744	650	724
Mchy., Except Elec.	D	D	D	D	258	D	D	D
SOUTH AFRICA								
Total Manufacturing	117	147	211	174	137	90	70	68
Mchy , Except Elec.	18	19	18	14	12	10	7	6
AUSTRALIA								
Total Manufacturing	453	512	424	323	364	556	638	723
Mchy., Except Elec.	D	D	29	12	14	19	D	D

D – Withheld to avoid disclosure. r – Revised.

(a) Excludes Japan.

* – "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

EXPENDITURES ON NEW PLANT AND EQUIPMENT

Major Industries, Selected Years, 1960 to Date

(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 39.44	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$ 1.47	$0.47
1965	59.52	25.41	13.49	1.69	2.24	3.00	0.74
1970	91.91	36.99	19.80	3.49	3.78	3.05	1.60
1971	92.91	33.60	16.78	3.03	3.15	2.42	1.12
1972	103.40	35.42	18.22	2.83	3.23	3.00	1.41
1973	120.03	42.35	22.63	3.48	3.95	3.83	1.77
1974	139.67	52.48	26.77	3.80	5.13	4.29	2.31
1975	142.42	53.66	25.37	3.08	4.86	3.33	2.13
1976	158.44	58.53	27.50	3.61	5.43	3.60	2.19
1977	184.82	67.48	32.77	4.61	6.35	5.82	2.50
1978	217.76	78.58	39.46	5.89	7.42	7.19	3.63
1979	254.96	95.92	48.50	7.55	10.17	8.34	4.71
1980	282.80	112.33	55.36	9.77	11.41	9.02	5.96
1981	315.22	126.54	59.81	10.58	13.68	9.83	5.60
1982	310.58	120.68	55.35	11.01	13.44	7.77	4.79
1983	304.78	116.20	53.08	11.42	13.50	7.29	4.04
1984	354.44	138.82	66.24	14.61	15.41	11.20	4.98
1985(r)	387.13	153.48	73.27	15.47	15.98	14.63	4.83
1986(r)	379.27	142.73	69.08	14.09	13.62	13.97	4.93
1987E	390.80	144.88	70.60	15.94	12.61	12.55	4.56

E – Estimate. r – Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (monthly), Estimate, "Survey of Current Business," (April).

NEW PLANT AND EQUIPMENT PROJECTS

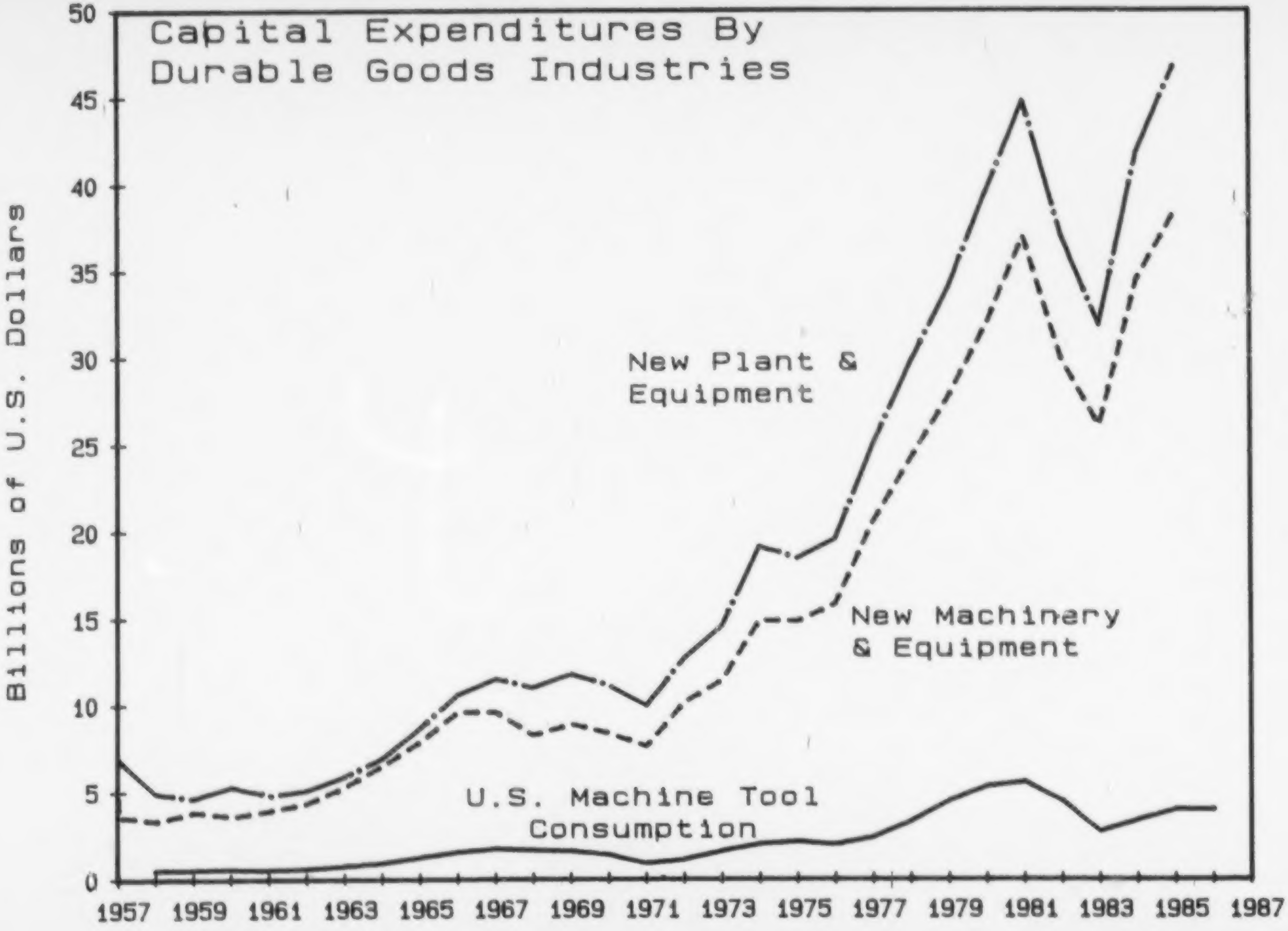
Starts During Year and Carry – Over at Year End, 1970 to 1983

(Billions of Dollars)

	Total Manufacturing		Durables		Electrical Machinery		Nonelectrical Machinery		Transportation Equipment		Public Utilities	
Year	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over
1970	$ 33.82	$22.81	$17.41	$11.86	$ 2.91	$2.99	$ 3.66	$1.06	$ 4.12	$ 2.85	$16.76	$ 23.16
1971	31.78	20.99	15.86	10.93	2.35	2.31	2.98	.89	3.78	3.09	20.69	29.15
1972	38.97	24.54	19.30	12.01	2.63	2.10	3.39	1.04	4.74	3.42	29.77	42.65
1973	53.21	35.38	28.07	17.33	4.12	2.72	4.43	1.50	7.02	4.79	36.22	60.91
1974	61.24	43.41	31.07	21.59	3.55	2.42	6.20	2.47	7.11	5.03	47.72	88.79
1975	56.51	45.00	23.71	18.98	2.59	1.88	5.33	2.84	4.40	3.52	39.32	108.14
1976	59.38	44.44	29.80	20.30	4.27	2.49	6.20	3.52	6.64	3.77	28.09	113.86
1977	77.40	52.62	36.59	22.85	4.80	2.62	6.84	3.77	10.63	5.33	34.53	121.60
1978	88.16	61.05	46.20	28.62	6.27	3.20	7.71	4.27	15.62	8.94	38.74	130.39
1979	112.98	75.35	59.18	36.72	8.16	4.08	12.66	6.41	19.01	12.63	21.67	118.10
1980	123.32	85.16	57.67	36.92	10.25	5.11	10.72	5.81	16.50	11.42	43.69	130.16
1981	135.19	93.73	68.89	44.37	11.50	6.49	15.95	8.75	19.35	12.26	34.98	126.04
1982	104.35	79.21	45.73	33.25	8.97	4.75	11.02	6.73	13.87	10.97	15.11	99.48
1983	114.51	82.04	53.28	34.90	12.49	6.33	12.62	7.06	13.55	11.50	26.98	85.46

Note: The publication of this data was discontinued in 1983.

Source: U.S. Department of Commerce, "Survey of Current Business" (March).


Capital Expenditures By
Durable Goods Industries
New Plant &
Equipment
New Machinery
& Equipment
U.S. Machine Tool
Consumption
Billions of U.S. Dollars
0
5
10
15
20
25
30
35
40
45
50
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1953 to Date

	New Plant & Equipment Expenditures Billion Dollars				U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of		
	BEA (a)	Census (b)				BEA (a)	Census (b)	
Year	Total	Total	Plant	Equipment		Total	Total	Equipment
1953	$ 5.31	$ 4.26	$1.25	$ 3.01	NA	NA	NA	NA
1954	4.91	4.32	1.20	3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.95	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.34	1.33	3.61	$ 554.9	9.9%	NA	NA
1959	6.73	4.64	1.29	3.35	587.1	8.7	13.6%	18.8%
1960	8.28	5.34	1.47	3.87	634.0	7.7	12.3	16.9
1961	7.42	4.81	1.21	3.60	544.4	7.3	12.3	16.4
1962	7.81	5.12E	1.17E	3.95E	625.0	8.0	13.5	17.4
1963	8.64	5.92	1.55	4.37	798.3	9.2	14.7	19.9
1964	10.99	6.95	1.64	5.31	967.2	8.8	15.1	19.7
1965	13.49	8.70	2.18	6.52	1,263.5	9.4	15.4	20.6
1966	17.23	10.61E	2.72E	7.89E	1,588.9	9.2	15.6	21.0
1967	17.82	11.52	1.92	9.60	1,780.0	10.0	16.1	19.3
1968	17.93	10.97	2.71	8.26	1,669.8	9.3	15.6	20.7
1969	19.97	11.81	2.90	8.91	1,605.9	8.0	14.1	18.7
1970	19.80	11.11	2.74	8.37	1,391.5	7.0	13.0	17.3
1971	16.78	9.96	2.34	7.62	896.4	5.3	9.6	12.6
1972	18.22	12.70	2.56	10.14	1,145.1	6.3	9.5	12.0
1973	22.63	14.58	3.15	11.43	1,629.4	7.2	11.9	15.1
1974	26.77	19.13	4.26	14.87	2,026.2	7.6	11.1	14.3
1975	25.37	18.42	3.60	14.82	2,187.0	8.6	12.5	15.5
1976	27.50	19.57	3.75	15.82	1,981.6	7.2	11.0	13.6
1977	32.77	24.93	4.41	20.52	2,427.6	7.4	10.3	12.5
1978	39.46	29.66	5.52	24.14	3,324.8	8.4	11.3	13.9
1979	48.50	33.91	6.22	27.69	4,488.7	9.3	13.9	17.1
1980	55.36	39.42	7.62	31.80	5,338.0	9.6	13.8	17.1
1981	59.81	44.75	7.83	36.91	5,593.2	9.4	13.1	15.9
1982	55.35	37.02	7.23	29.80	4,447.4	8.0	12.0	14.9
1983	53.08	31.78	5.80	25.98	2,706.9	5.1	8.5	10.4
1984(r)	66.24	41.74	7.33	34.42	3,371.9	5.1	8.1	9.8
1985(r)	73.27	46.72	8.43	38.29	4,006.1	5.5	8.6	10.5
1986	69.08	NA	NA	NA	4,450.3	6.4	NA	NA

NA – Not Available. E – Estimate. r – Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, "Survey of Current Business;" Bureau of the Census, "Annual Survey of Manufactures," M(AS) – 5, Expenditures for New Plant and New Equipment; U.S. Bureau of the Census, "FT 135" and earlier reports; and National Machine Tool Builders' Association.

→ The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT

By Major Machine Tool Consuming Industries, 1947 to Date

(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1947	NA	$ 212.7	$ 312.5	$ 179.7	$ 75.5	$ 18.8
1948	NA	NA	NA	NA	NA	NA
1949	NA	167.8	214.5	133.5	147.9	27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$ 3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1374	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7
1981	36,912	3,791.8	7,040.1	5,098.1	7,539.0	1,325.4
1982	29,796	2,934.0	6,489.4	5,364.4	3,377.7	1,230.1
1983	25,977	2,316.3	5,447.0	5,826.6	1,991.2	1,107.1
1984	34,416	3,203.4	6,603.9	8,146.8	3,801.7	1,508.1
1985	38,288	3,635.7	6,996.3	8,378.1	5,185.0	1,820.9

NA – Not Available. S – Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $640 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures, M(AS) – 4, Expenditures for New Plant and New Equipment."

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES (r)

Selected Years, 1960 to Date

(Billions of Dollars)

Year	Purchases		Depreciation (a)		Net Investment (b)		Net Value (c)	
	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1960	$10.4	$ 7.5	$ 8.4	$ 6.7	$ 2.0	$ .8	$ 94.7	$ 63.3
1965	18.0	12.8	10.4	8.2	7.6	4.6	121.1	78.5
1970	23.8	17.4	16.5	12.7	7.3	4.7	203.8	126.8
1971	22.6	16.8	17.9	13.6	4.5	3.2	219.9	134.2
1972	25.2	19.4	19.7	14.6	5.5	4.8	233.6	141.3
1973	27.9	21.3	20.7	15.4	7.2	5.9	255.3	153.9
1974	37.4	28.5	23.8	17.8	13.6	10.7	313.5	193.6
1975	38.5	30.5	28.7	22.0	9.8	8.5	351.3	226.3
1976	41.7	33.3	31.9	24.7	9.8	8.6	382.5	248.4
1977	48.0	39.2	35.6	27.6	12.4	11.6	424.9	278.7
1978	58.2	47.2	40.2	31.4	18.0	15.8	493.7	317.9
1979	67.3	52.8	46.5	36.3	20.7	16.5	550.8	363.8
1980	75.3	60.6	53.1	41.8	22.2	18.8	633.9	424.9
1981	81.9	65.4	61.0	48.3	20.9	17.1	713.4	418.7
1982	78.3	61.6	67.2	53.5	11.1	8.1	715.2	513.5
1983	68.4	55.9	70.0	55.5	-1.6	.4	768.0	517.4
1984	82.4	69.1	72.7	57.5	9.7	11.6	797.6	537.1
1985	88.8	73.4	75.7	60.0	13.1	13.4	823.0	558.7
1986	80.2	65.5	77.4	60.9	2.8	4.6	835.4	557.5
In 1982 Dollars								
1960	$34.5	$23.6	$27.4	$20.9	$ 7.1	$ 2.7	$321.2	$202.2
1965	56.4	38.4	31.4	23.7	25.0	14.7	382.4	235.8
1970	59.9	42.7	40.8	30.0	19.1	12.1	513.3	314.3
1971	53.8	39.4	42.3	31.7	11.5	7.7	525.3	322.6
1972	57.1	43.6	45.1	33.4	12.0	10.2	537.7	333.4
1973	61.6	47.7	45.8	34.6	5.8	13.1	554.2	347.2
1974	74.0	57.1	47.6	36.3	6.4	20.8	581.1	368.6
1975	65.1	51.3	49.8	38.1	5.3	13.2	597.2	382.5
1976	66.2	52.1	51.8	39.9	14.4	12.2	612.5	395.5
1977	71.4	57.8	54.1	41.8	17.3	16.0	630.5	412.3
1978	80.2	64.7	56.4	44.0	23.8	20.7	655.1	433.7
1979	85.1	66.7	59.7	46.6	25.4	20.1	681.4	454.8
1980	86.8	69.8	62.0	48.9	26.8	20.9	707.2	476.6
1981	86.2	68.8	64.8	51.4	21.4	17.4	729.7	495.0
1982	77.8	61.0	67.2	53.5	10.6	7.5	741.3	503.6
1983	67.6	55.7	68.9	55.0	-1.3	0.7	741.1	505.3
1984	81.0	68.8	70.7	56.7	10.3	12.1	752.8	518.8
1985	87.1	73.4	73.1	59.0	14.0	14.4	768.3	534.6
1986	78.8	66.2	74.3	60.1	4.5	6.1	763.2	527.8

r – Revised.

(a) Straight – line depreciation.
(b) Represents the difference between the purchase and depreciation series.
(c) Represents net value in preceding year plus net investment based on straight – line depreciation for year shown.
(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1966 to Date (r)

	All Manufacturing		Durables		Nonelectrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In Current Dollars (Billions)						
1966	$ 25.4	$20.2	$14.0	$11.4	$ 2.8	$1.5
1967	23.9	19.9	12.0	11.0	2.5	1.4
1968	24.8	20.9	12.6	11.5	2.4	1.3
1969	29.5	23.4	15.0	12.4	3.0	1.3
1970	25.3	20.9	12.4	10.8	3.1	1.2
1971	23.1	18.9	11.2	9.4	2.7	1.3
1972	28.8	23.3	14.1	11.8	3.2	1.8
1973	42.9	37.1	21.6	18.7	4.3	2.6
1974	53.7	49.8	24.9	22.7	5.8	3.8
1975	45.0	46.4	16.2	18.1	3.7	3.5
1976	50.0	47.5	22.4	21.0	5.0	4.0
1977	63.4	56.5	26.6	24.6	5.1	4.2
1978	67.2	63.4	33.1	31.1	6.3	5.0
1979	88.5	76.5*	43.3	38.8*	10.2	6.9*
1980	104.6	90.7*	44.3	40.8*	9.4	6.5*
1981	107.0	92.5*	42.1	39.6*	12.7	8.6*
1982	87.5	70.8*	32.0	27.0*	8.7	5.4*
1983	88.2	73.5*	37.5	29.5*	7.9	5.3*
1984	116.1	94.4*	59.6	44.3*	10.9	7.1*
1985(r)	107.1	94.6*	51.7	41.8*	11.4	7.1*
1986	87.2	69.7*	42.6	28.3*	7.5	6.5*
In Constant 1982 Dollars (Billions)						
1966	$ 74.5	NA	$40.0	NA	$ 7.8	NA
1967	68.6	NA	33.5	NA	6.8	NA
1968	66.7	NA	33.7	NA	6.3	NA
1969	75.7	NA	37.8	NA	7.4	NA
1970	61.8	NA	30.1	NA	7.5	NA
1971	52.8	NA	25.0	NA	6.2	NA
1972	64.7	NA	31.6	NA	7.0	NA
1973	95.6	NA	48.0	NA	9.2	NA
1974	112.4	NA	51.3	NA	11.5	NA
1975	77.7	NA	27.8	NA	6.4	NA
1976	79.5	NA	35.7	NA	8.0	NA
1977	96.0	NA	40.2	NA	7.5	NA
1978	93.1	NA	46.2	NA	8.6	NA
1979	113.0	NA	54.6	NA	12.7	NA
1980	121.3	NA	50.3	NA	10.4	NA
1981	113.1	NA	45.0	NA	13.6	NA
1982	85.2	NA	31.6	NA	8.6	NA
1983	88.7	NA	37.8	NA	8.1	NA
1984	118.1	NA	60.2	NA	10.9	NA
1985	108.3	NA	51.4	NA	11.3	NA
1986	86.4	NA	42.5	NA	7.5	NA

r – Revised. NA – Not Available. * – Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1983 to Date

(Millions of Dollars)

Industry Group	1983 Total	1983 Machinery & Equipment	1984 Total	1984 Machinery & Equipment	1985 Total	1985 Machinery & Equipment
All Operating Manufacturing Establishments	$730,526	$559,622	$771,714	$591,925	$821,221	$631,665
Fabricated Metal Products	41,455	31,476	43,286	33,093	45,671	35,037
Nonelectrical Machinery	70,163	51,893	73,987	55,116	77,401	57,897
Construction & Related Machinery	12,848	9,087	12,200	8,629	11,684	8,258
Metalworking Machinery	7,603	5,834	8,157	6,253	8,619	6,638
Metal Cutting Machine Tools	1,677	1,205	1,638	1,171	1,632	1,172
Metal Forming Machine Tools	639	464	595	430	657	476
Other Metalworking Machinery	5,286	4,165	5,924	4,652	6,330	4,990
Special Industrial Machinery	4,217	2,964	4,643	3,306	4,975	3,572
General Industrial Machinery	9,382	7,012	10,126	7,624	10,534	7,990
Office & Computing Machines	14,055	10,045	15,971	11,595	17,864	13,119
Other Nonelectrical Machinery	22,058	16,951	22,890	17,709	23,725	18,320
Electrical Machinery	51,715	37,293	59,589	43,501	67,116	48,822
Transportation Equipment	61,166	44,511	66,025	48,128	72,796	53,356
Instruments & Related Products	17,313	12,085	19,126	13,403	20,655	14,771

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures."

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)

Selected Industry Groups, 1977 to Date

(Millions of Dollars)

Year: Qrt.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1977:1	$310,962	$11,443	$25,206	$15,780	$21,806	$ 7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1	393,630	14,681	33,204	19,480	29,982	8,343
:2	405,188	15,213	34,931	20,048	31,289	8,631
:3	418,836	15,556	36,345	20,925	32,857	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1	455,115	15,871	41,330	22,360	35,514	9,549
:2	468,348	16,309	42,619	23,204	36,913	9,826
:3	487,080	16,569	44,381	24,323	38,312	10,253
:4	515,022	18,607	46,718	26,186	39,861	10,761
1981:1	529,406	18,886	47,618	27,048	41,440	11,101
:2	547,707	19,391	49,446	28,072	42,533	11,491
:3	565,901	19,493	51,334	29,106	43,911	11,837
:4	586,077	19,846	54,078	30,817	44,746	12,425
1982:1	604,415	20,269	55,103	30,912	45,858	12,771
:2	618,376	20,952	56,950	31,808	46,481	13,047
:3	631,131	21,172	58,678	32,913	47,362	13,579
:4	643,348	21,688	59,010	33,407	48,240	13,939
1983:1	648,112	22,380	58,624	33,792	48,033	14,111
:2	653,660	21,964	58,452	33,735	47,702	14,372
:3	658,354	22,172	58,386	34,787	47,700	14,231
:4	663,282	21,464	50,403	35,921	49,406	14,797
1984:1	669,032	21,456	50,889	36,636	48,473	14,941
:2	678,085	21,814	51,033	37,804	49,622	15,164
:3	688,359	22,247	50,761	39,843	50,438	15,505
:4(r)	704,110	23,324	50,967	41,996	50,178	17,040
1985:1	703,569	23,249	51,305	42,107	51,284	18,026
:2	709,226	23,636	52,279	42,757	52,567	18,433
:3	714,467	23,375	52,554	42,273	54,421	18,844
:4(r)	719,861	24,659	52,340	45,754	57,602	19,196
1986:1	731,689	24,921	51,893	44,619	64,241	19,091
:2	730,942	24,944	51,771	42,537	66,312	19,550
:3	733,158	24,980	51,942	43,328	68,572	19,408
:4(p)	735,894	26,505	52,956	42,151	71,033	19,297

p – Preliminary. r – Revised.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Short-term Rates, 1970 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1970	8.48%	8.86%	8.49%	8.50%	8.07%
1971(a)	6.48	6.59	6.01	6.51	6.18
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.70
1981	19.56	19.91	19.99	21.11	17.23
1982	14.69	17.13	17.11	13.27	11.26
1983	10.64	10.20	10.31	11.09	10.95
1984	12.02	11.06	12.45	13.29	11.29
1985	9.74	10.10	9.90	9.27	9.68
1986	8.11	9.29	8.13	7.73	7.28

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .16% decrease from 6.75% to 6.59%.

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Long-term Rates, 1970 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1970	8.47%	8.67%	8.25%	8.66%	8.31%
1971(a)	6.57	6.82	6.36	6.67	6.44
1972	6.12	5.64	5.87	6.31	6.67
1973	8.83	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.08	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94
1982	15.25	16.59	16.96	15.22	12.24
1983	12.01	11.81	11.46	11.83	12.94
1984	12.89	11.92	13.12	13.81	12.69
1985	10.72	11.10	11.03	10.44	10.31
1986	9.08	10.26	9.07	8.73	8.24

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .08% decrease from 6.90% to 6.82%.

Source: Federal Reserve Board.

COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1969 to Date

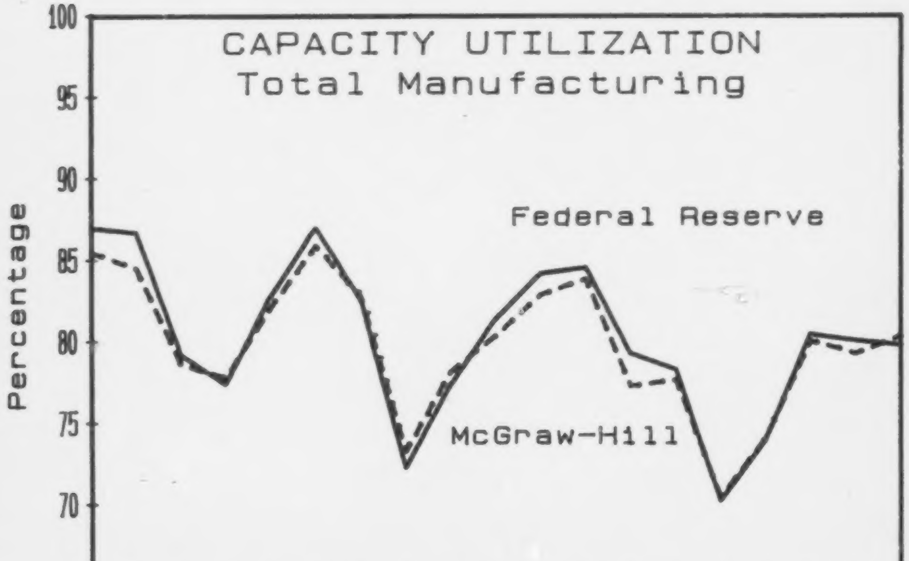
Year	Federal Reserve Board	Bureau of Economic Analysis	McGraw-Hill
1969	86.7%	85%	84.5%
1970	79.2	81	78.6
1971	77.4	80	77.8
1972	82.8	83	82.1
1973	87.0	86	85.9
1974	82.6	83	82.8
1975	72.3	77	73.3
1976	77.4	81	78.2
1977	81.4	83	80.4
1978	84.2	84	82.9
1979	84.6	83	83.9
1980	79.3	78	77.3
1981	78.3	76	77.7
1982	70.3	70	70.5
1983	74.0	74	74.1
1984(r)	80.5	(a)	80.1
1985(r)	80.1	(a)	79.3
1986	79.8	(a)	80.4

(r) – Revised.

(a) The publication of this data was discontinued in 1983.

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; McGraw-Hill Publications Company.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING
Federal Reserve Board, Operating Rates (a)
1968 to Date

Year	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles(b)	Primary Metals	Fabricated Metals
1968	87.0%	86.7%	84.0%	85.1%	93.0%	86.6%	86.2%
1969	86.7	86.1	82.3	86.0	90.5	91.7	83.3
1970	79.2	76.1	73.5	77.9	68.8	83.0	74.4
1971	77.4	73.3	70.0	69.0	82.2	76.7	72.1
1972	82.8	79.7	76.8	77.6	86.0	85.8	77.4
1973	87.0	86.2	84.2	86.6	94.5	96.6	84.0
1974	82.6	81.6	79.9	87.1	78.4	92.1	78.8
1975	72.3	69.6	66.0	72.0	64.5	72.9	67.3
1976	77.4	74.8	71.6	72.7	81.1	80.7	74.0
1977	81.4	79.4	78.6	77.8	89.1	81.0	80.1
1978	84.2	82.9	83.3	82.1	89.0	87.0	83.8
1979	84.6	84.1	87.2	84.2	78.2	88.6	85.5
1980	79.3	77.9	84.6	79.2	57.8	74.7	78.4
1981	78.3	76.7	80.0	78.5	59.0	78.3	77.3
1982	70.3	66.9	70.5	67.0	54.3	54.2	65.4
1983	74.0	70.3	72.7	66.4	68.9	62.0	67.2
1984	80.8	79.0	80.2	76.5	82.5	72.5	77.4
1985	80.3	78.3	73.7	74.9	83.9	73.1	81.0
1986	79.8	76.7	71.5	71.1	79.8	69.1	80.4
1981 1st Qtr.	79.5	78.0	81.3	79.0	59.3	83.9	77.8
2nd Qtr.	79.3	77.8	80.9	79.5	63.9	78.1	77.6
3rd Qtr.	79.0	77.5	80.7	79.7	59.6	80.2	78.6
4th Qtr.	75.3	73.3	77.3	75.9	53.3	71.0	75.0
1982 1st Qtr.	72.4	69.5	73.2	71.9	50.2	63.2	69.7
2nd Qtr.	70.8	67.8	71.8	67.9	58.1	53.6	66.4
3rd Qtr.	69.8	66.2	69.6	64.8	58.1	52.3	63.9
4th Qtr.	68.2	63.9	67.6	63.4	50.8	47.5	61.5
1983 1st Qtr.	70.2	66.0	68.6	62.4	59.4	55.2	63.3
2nd Qtr.	72.5	68.5	70.9	65.0	64.8	58.3	65.0
3rd Qtr.	75.8	72.1	74.1	68.3	72.7	64.5	68.7
4th Qtr.	77.4	74.5	77.2	70.0	78.6	69.9	71.7
1984 1st Qtr.	79.8	77.6	79.0	73.5	84.5	73.1	75.1
2nd Qtr.	80.8	78.8	79.9	76.7	81.4	72.2	77.0
3rd Qtr.	81.6	80.0	81.0	78.6	82.2	73.0	78.4
4th Qtr.	81.0	79.4	80.8	76.9	81.7	71.7	79.3
1985 1st Qtr.	80.5	79.0	77.2	75.9	84.9	73.1	80.8
2nd Qtr.	80.3	78.5	74.1	76.1	82.7	71.0	81.3
3rd Qtr.	80.3	78.1	71.5	75.0	84.9	72.9	80.7
4th Qtr.	80.0	77.7	71.9	72.6	83.1	75.2	81.2
1986 1st Qtr.	80.0	77.5	71.7	72.8	82.3	72.3	81.2
2nd Qtr.	79.5	76.4	71.2	70.9	79.8	68.1	80.1
3rd Qtr.	79.7	76.3	71.4	70.9	79.4	67.4	79.5
4th Qtr.	79.8	76.5	71.7	69.9	77.8	68.7	80.7

(a) Quarterly data is seasonally adjusted.
(b) Includes Parts.

Source: Federal Reserve Board.

CAPACITY UTILIZATION IN MANUFACTURING
McGraw-Hill, Operating Rates, Seasonally Adjusted
1968 to Date

Year	Total Mfg.	Total Durables	Metal-working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1968	85.5%	84.7%	85.9%	84.7%	83.3%	85.4%	93.0%
1969	84.5	84.0	84.3	81.4	78.0	87.9	94.3
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.9
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	[illegible]	76.6	81.3	59.3
1981	77.7	75.3	75.6	[illegible]	79.7	80.6	62.7
1982	70.5	66.0	67.7	[illegible]	74.1	68.0	59.1
1983	74.1	70.1	70.4	68.3	75.5	67.3	73.0
1984	80.1	78.3	78.6	76.8	81.1	78.2	85.4
1985(r)	79.3	77.9	78.8	78.6	73.1	80.6	88.7
1986	80.4	78.7	78.8	78.6	68.1	79.2	88.1
1981 1st Qtr.	78.6	76.2	75.8	79.7	79.0	81.4	60.9
2nd Qtr.	78.8	76.8	77.2	79.7	80.3	81.7	68.6
3rd Qtr.	78.8	76.5	76.7	78.8	81.0	82.0	64.7
4th Qtr.	74.6	71.5	72.6	73.0	78.4	77.1	56.7
1982 1st Qtr.	71.9	68.1	69.2	68.0	76.1	72.5	52.7
2nd Qtr.	70.9	67.0	69.0	65.9	75.4	68.8	63.4
3rd Qtr.	70.5	66.0	67.8	64.8	73.5	66.8	64.0
4th Qtr.	68.6	63.0	64.9	61.5	71.2	63.9	56.1
1983 1st Qtr.	70.0	65.2	66.8	63.3	71.6	62.5	63.7
2nd Qtr.	72.9	68.5	68.5	66.4	74.3	65.8	69.2
3rd Qtr.	76.3	72.2	72.0	71.2	76.7	69.8	77.3
4th Qtr.	77.6	74.4	74.1	72.4	79.4	71.3	81.8
1984 1st Qtr.	79.5	77.5	77.3	74.9	81.6	74.6	87.0
2nd Qtr.	80.3	78.3	78.2	76.6	81.4	77.4	84.6
3rd Qtr.	80.9	79.2	79.9	77.9	81.7	80.7	85.3
4th Qtr.	79.6	78.2	79.2	77.5	79.7	80.1	84.6
1985 1st Qtr.(r)	79.2	78.1	79.3	78.3	76.6	80.3	87.9
2nd Qtr.(r)	79.3	77.9	79.1	78.9	73.9	81.5	87.5
3rd Qtr.(r)	79.3	77.8	78.6	78.3	71.2	80.5	90.3
4th Qtr.(r)	79.2	77.6	78.2	79.0	70.7	80.2	88.8
1986 1st Qtr.(r)	79.8	78.1	78.6	79.4	69.1	79.9	90.3
2nd Qtr.	79.6	77.6	78.1	78.3	68.1	78.6	87.9
3rd Qtr.	80.4	78.5	79.0	77.7	67.8	79.4	87.8
4th Qtr.	81.6	80.4	79.6	78.8	67.5	79.0	86.4
1987 1st Qtr.	82.4	80.1	79.2	73.9	78.3	75.2	103.4

r – Revised.

Source: McGraw-Hill Publications Company.

INDUSTRIAL PRODUCTION INDEXES

Major and Selected Industry Groupings, 1966 to Date

1977 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1966	72.0	71.7	76.2	NA	78.8	67.6
1967	73.5	73.1	77.0	91.4	82.5	68.9
1968	77.6	77.2	80.8	94.7	86.9	69.5
1969	81.2	80.6	84.0	101.9	88.4	75.2
1970	78.5	77.0	77.6	94.8	81.9	72.8
1971	79.6	78.2	77.3	89.9	81.5	67.6
1972	87.3	86.4	86.3	100.7	89.4	78.5
1973	94.4	94.0	96.3	114.3	99.4	91.7
1974	93.0	92.6	94.3	110.7	95.4	97.7
1975	84.8	83.4	82.6	88.2	82.7	84.5
1976	92.6	91.9	91.1	98.7	91.6	88.8
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	106.5	107.1	108.2	107.0	105.7	111.7
1979	110.7	111.5	113.9	108.5	109.4	122.6
1980	108.6	108.2	109.1	90.4	101.8	123.3
1981	111.0	110.5	111.1	95.0	101.6	129.8
1982	103.1	102.2	99.9	65.8	86.6	115.6
1983	109.2	110.2	107.7	73.0	89.1	118.3
1984	121.8	123.9	124.8	82.4	102.8	142.0
1985	124.6	127.1	128.2	80.6	107.9	146.4
1986	125.0	129.1	127.9	75.8	107.4	141.9

NA – Not Available.

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES

(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aerospace and Misc.	Instruments
1966	64.2	85.1	66.2	121.5	47.3
1967	64.5	83.2	58.2	132.5	51.4
1968	68.1	90.4	69.7	130.0	56.6
1969	72.5	89.7	70.0	127.0	60.8
1970	69.3	75.3	56.3	111.9	60.3
1971	69.6	81.5	70.6	100.4	63.2
1972	79.7	87.0	77.1	103.7	70.9
1973	90.7	99.1	89.8	114.7	80.9
1974	89.8	90.1	77.5	111.3	85.7
1975	77.2	81.0	65.7	106.7	81.4
1976	86.8	92.2	86.5	101.7	89.4
1977	100.0	100.0	100.0	100.0	100.0
1978	112.9	106.3	104.6	108.7	111.5
1979	125.7	108.3	95.9	125.1	118.7
1980	130.3	96.9	71.1	132.0	122.0
1981	134.1	95.1	71.6	127.0	126.3
1982	128.4	87.6	66.8	115.7	125.3
1983	143.8	99.2	85.8	117.4	123.2
1984	172.4	113.6	105.6	124.4	136.9
1985	169.3	123.2	112.8	137.5	139.8
1986	166.5	125.8	110.9	146.1	141.3

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING (r)

Indexes, 1947 to Date

1977 = 100

Year	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1947	43.9	35.0	79.9	17.5	47.4	39.8
1948	46.6	37.0	79.4	19.4	49.0	41.8
1949	48.5	35.1	72.4	20.3	51.7	41.9
1950	51.1	40.0	78.2	21.4	53.8	41.8
1951	53.1	44.7	84.2	23.5	54.9	44.3
1952	54.1	46.2	85.4	25.1	57.2	46.3
1953	55.3	49.6	89.8	26.4	59.9	47.8
1954	56.0	46.0	82.1	27.6	62.3	49.3
1955	58.7	50.8	86.6	28.7	64.9	48.9
1956	58.3	51.3	87.9	30.5	68.1	52.3
1957	59.6	51.5	86.5	32.3	69.7	54.3
1958	59.3	47.0	79.4	33.8	70.9	57.1
1959	61.9	52.4	84.6	35.1	73.0	56.7
1960	62.2	52.5	84.4	36.5	74.8	58.7
1961	64.0	52.6	82.3	37.6	76.1	58.7
1962	66.7	57.1	85.6	39.0	78.2	58.5
1963	71.2	61.6	86.5	40.2	79.6	56.4
1964	74.6	66.0	88.4	41.9	81.7	56.1
1965	76.6	71.7	93.6	42.7	82.0	55.8
1966	77.4	77.2	99.7	44.6	83.3	57.7
1967	77.4	77.0	99.5	46.9	85.1	60.6
1968	79.8	80.9	101.4	50.2	87.5	62.9
1969	80.8	83.2	103.0	53.7	88.8	66.5
1970	80.8	78.6	97.3	57.4	89.5	71.0
1971	85.3	79.9	93.7	60.9	91.1	71.4
1972	89.0	87.0	97.7	64.2	92.9	72.1
1973	93.4	96.3	103.1	68.8	93.8	73.7
1974	90.6	91.7	101.2	76.2	93.6	84.1
1975	92.9	84.9	91.4	85.1	95.9	91.7
1976	97.1	93.1	95.9	92.1	98.1	94.9
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	101.5	106.0	104.4	108.2	100.5	106.6
1979	101.4	108.1	106.5	118.6	99.1	117.0
1980	101.4	103.2	101.7	132.4	97.4	130.6
1981	103.6	104.8	101.1	145.2	96.7	140.1
1982	105.9	98.4	92.9	157.5	98.9	148.7
1983	112.0	104.7	93.5	162.4	98.8	145.0
1984	116.6	116.0	99.5	168.2	98.1	144.2
1985	121.7	120.4	98.9	176.7	99.5	145.1
1986	126.0	124.4	98.7	181.9	100.5	144.3
1986						
1st Qtr.	124.4	123.5	99.3	180.2	99.8	144.9
2nd Qtr.	125.7	123.6	98.4	181.4	100.8	144.3
3rd Qtr.	127.0	124.7	98.2	182.5	100.8	143.7
4th Qtr.	127.1	125.9	99.0	183.5	100.7	144.4
1987						
1st Qtr.	127.7	127.0	99.4	183.0	99.1	143.3

r – Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.

(b) Compensation per hour adjusted for changes in the Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS

1952 to Date

		Selected Leading Indicators					
	Composite 12 Leading Indicators	Average Workweek, Mfg.	Layoff Rate, Mfg.	New Orders Consumer Goods	Orders for Plant & Equipment	Net Change in Inventories	Change in Sensitive Prices
Year	1967 = 100	Hours	Per 100 Employees	$82 Billion	$82 Billion	$82 Billion Annual Rate	Percent
1952	57.1	40.7	1.4	$36.10	$ 9.24	$ 10.0	-0.8%
1953	67.9	40.5	1.6	37.14	8.77	2.8	-0.5
1954	58.6	39.6	2.3	34.67	7.31	-4.8	0.3
1955	66.6	40.7	1.5	44.48	9.98	16.3	0.5
1956	66.5	40.4	1.7	40.94	10.50	12.9	-0.1
1957	64.5	39.8	2.1	38.91	8.94	3.0	-0.6
1958	65.7	39.2	2.6	36.96	8.03	-3.4	0.3
1959	73.1	40.3	2.0	43.19	9.52	16.5	0.3
1960	71.3	39.7	2.4	40.66	9.28	7.7	-0.5
1961	75.2	39.8	2.2	42.79	9.47	7.3	0.1
1962	79.6	40.4	2.0	45.55	10.28	16.2	-0.2
1963	84.5	40.5	1.8	48.89	11.27	16.6	0.1
1964	90.6	40.7	1.7	53.05	14.38	15.7	0.5
1965	96.0	41.2	1.4	57.97	15.74	25.2	0.1
1966	99.0	41.4	1.2	61.72	18.17	36.9	-0.3
1967	100.0	40.6	1.4	60.89	16.74	28.8	-0.1
1968	107.2	40.7	1.2	80.59	22.09	21.0	0.5
1969	111.1	40.6	1.2	67.50	23.67	25.1	0.6
1970	105.5	39.8	1.8	61.56	20.47	8.2	-0.4
1971	113.5	39.9	1.6	64.27	21.48	19.6	0.4
1972	125.0	40.5	1.1	72.61	23.59	21.8	1.0
1973	132.2	40.7	0.9	80.89	29.25	40.0	2.3
1974	121.2	40.0	1.5	74.50	29.13	33.3	-0.1
1975	115.7	39.5	2.1	63.96	22.03	-12.8	-0.3
1976	130.9	40.1	1.3	73.01	24.72	22.1	1.1
1977	139.4	40.3	1.1	65.15	27.28	29.1	0.4
1978	145.8	40.4	0.9	85.18	31.70	36.8	1.3
1979	145.1	40.2	1.1	83.59	33.82	15.0	0.9
1980	138.2	39.7	1.7	74.26	29.97	-6.9	0.1
1981	140.9	39.8	1.5	73.96	29.28	23.9	-0.6
1982	136.8	38.9	NA	65.15	24.77	-24.5	-0.7
1983	156.0	40.1	NA	75.21	27.03	5.5	1.0
1984(r)	165.7	40.7	NA	82.28	31.78	59.2	-0.2
1985(r)	168.6	40.5	NA	84.60	32.68	9.0	-0.4
1986(p)	179.3	40.7	NA	80.71	34.23	13.8	0.1
1986 1st Qtr.(p)	174.8	40.7	NA	87.02	30.91	39.9	-0.3
2nd Qtr.(p)	178.4	40.7	NA	79.85	30.81	15.1	-0.3
3rd Qtr.(p)	179.9	40.7	NA	80.39	33.46	-0.3	0.0
4th Qtr.(p)	183.6	40.8	NA	82.01	35.69	-14.4	1.0
1987 1st Qtr.(p)	186.4	41.0	NA	83.65	33.88	47.6	0.4

NA – Not Available. p – Preliminary. r – Revised.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1982 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly).

Twelve economic indicators normally precede changes in the business year. These are the "leading indicators," six of which are shown separately in the table together with the composite of the 12.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough		Peak		Expansion Duration (in Months) (a)
Dec.	1854	June	1857	30
Dec.	1858	Oct.	1860	22
June	1861	Apr.	1865	46(b)
Dec.	1867	June	1869	18
Dec.	1870	Oct.	1873	34
Mar.	1879	Mar.	1882	36
May	1885	Mar.	1887	22
Apr.	1888	July	1890	27
May	1891	Jan.	1893	20
June	1894	Dec.	1895	18
June	1897	June	1899	24
Dec.	1900	Sept.	1902	21
Aug.	1904	May	1907	33
June	1908	Jan.	1910	19
Jan.	1912	Jan.	1913	12
Dec.	1914	Aug.	1918	44(b)
Mar.	1919	Jan.	1920	10
July	1921	May	1923	22
July	1924	Oct.	1926	27
Nov.	1927	Aug.	1929	21
Mar.	1933	May	1937	50
June	1938	Feb.	1945	80(b)
Oct.	1945	Nov.	1948	37
Oct.	1949	July	1953	45(b)
May	1954	Aug.	1957	39
Apr.	1958	Apr.	1960	24
Feb.	1961	Dec.	1969	106(b)
Nov.	1970	Nov.	1973	36
Mar.	1975	Jan.	1980	58
July	1980	July	1981	12
Nov.	1982			
Average Peacetime Cycles:				
25 cycles, 1854 - 1981				27
11 cycles, 1919 - 1981				31
6 cycles, 1945 - 1981				34

(a) Time period from trough to peak.

(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES

Major Industry Groups, 1970 to Date

(Current Cost(a) in Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1970	$101.7	$ 66.8	$ 9.0	$ 7.8	$24.6	$ 4.9
1971	102.7	66.3	9.1	8.0	24.2	4.0
1972	108.2	70.3	9.6	8.5	25.3	4.3
1973	124.6	81.4	10.0	9.9	29.8	4.5
1974	157.8	101.7	13.4	13.4	37.5	4.9
1975	159.9	102.9	15.7	13.1	37.1	5.7
1976	175.2	112.6	17.6	14.4	37.7	6.5
1977	189.2	121.6	18.2	15.6	41.6	6.1
1978	210.5	137.9	19.4	17.3	49.4	6.4
1979	241.1	160.5	22.4	19.2	60.0	8.4
1980	264.3	174.6	23.0	19.6	68.5	10.7
1981	282.6	186.3	25.8	20.3	73.0	13.4
1982(r)	311.4	200.7	24.2	21.5	79.7	18.8
1983(r)	312.2	200.2	22.4	21.9	74.3	21.5
1984(r)	334.2	218.5	22.2	22.9	80.9	27.6
1985(r)	326.8	213.8	19.7	22.3	76.5	31.5
1986	318.2	207.9	17.3	21.2	71.8	33.9

r – Revised.

(a) Data prior to 1982 is based on Book Value.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982 – 1986" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES

Selected Industry Groups, 1970 to Date

(Current Cost(a) in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1970	$14.4	$ 9.8	$ 4.2	$10.4	$ 2.9
1971	14.2	9.4	4.2	9.6	3.0
1972	15.1	9.9	4.7	10.1	3.2
1973	18.4	12.1	5.8	10.7	3.8
1974	24.1	14.0	6.7	12.5	4.9
1975	24.1	13.0	6.1	13.5	4.8
1976	25.3	14.5	8.0	13.1	5.4
1977	27.3	16.4	9.2	13.3	6.0
1978	31.7	18.9	10.3	15.8	6.9
1979	37.1	23.0	10.9	20.7	7.9
1980	40.7	25.9	9.9	26.1	9.1
1981	43.5	28.4	9.1	28.5	9.7
1982(r)	48.1	30.6	8.4	34.6	11.3
1983(r)	44.7	32.0	10.0	34.3	11.5
1984(r)	48.3	38.2	11.5	38.9	12.5
1985(r)	45.5	38.2	11.6	40.4	12.7
1986	41.7	38.8	11.1	41.5	12.6

r – Revised.

(a) Data prior to 1982 is based on Book Value.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982 – 1986" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Major Industry Groups, 1970 to Date
(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1970	$ 624.8	$ 329.0	$ 51.8	$ 44.4	$ 81.6	$ 21.5
1971	671.9	360.1	51.3	44.4	90.2	19.0
1972	770.0	420.8	61.4	52.9	103.5	20.8
1973	915.1	515.2	80.8	64.8	131.7	23.7
1974	1,047.2	562.2	99.0	74.4	152.1	25.7
1975	1,021.8	504.2	74.1	64.4	132.1	24.8
1976	1,194.5	616.8	94.5	76.2	153.6	31.1
1977	1,380.4	733.0	105.5	91.5	183.5	35.2
1978	1,578.6	868.1	124.6	104.6	233.5	41.8
1979	1,768.8	953.4	139.6	116.6	278.8	34.1
1980	1,873.9	952.3	134.1	115.3	279.1	58.7
1981	2,013.0	1,002.6	137.0	122.4	288.6	59.1
1982(r)	1,939.2	932.1	98.9	112.0	257.6	80.0
1983(r)	2,087.0	1,049.8	112.7	120.7	265.7	98.6
1984(r)	2,280.8	1,186.5	117.1	136.9	320.6	104.2
1985(r)	2,287.6	1,195.2	110.2	137.6	323.6	110.3
1986	2,273.8	1,201.6	102.2	135.0	320.1	110.1

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS
Major Industry Groups, 1970 to Date
(Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1970	$105.9	$101.3	$ 7.7	$14.9	$ 47.8	$ 20.2
1971	106.8	101.7	7.4	13.5	49.4	19.6
1972	121.1	114.7	10.3	15.1	54.6	19.7
1973	161.3	153.9	18.5	21.1	70.5	22.0
1974	191.1	185.6	21.9	28.2	86.8	26.3
1975	173.8	165.9	15.1	24.1	79.4	28.1
1976	182.5	174.2	16.8	23.0	81.7	32.0
1977	203.5	195.0	17.2	24.5	90.9	37.2
1978	259.8	249.5	23.9	27.8	117.0	47.7
1979	302.1	290.9	26.1	30.9	149.2	49.0
1980	323.4	312.6	26.3	30.1	156.0	67.1
1981	319.1	309.1	21.4	28.9	146.9	78.1
1982(r)	306.3	297.3	14.9	22.5	126.4	101.6
1983(r)	338.8	328.1	19.2	21.0	120.4	125.6
1984(r)	365.2	355.1	17.1	22.0	130.0	146.0
1985(r)	373.5	363.0	17.0	20.0	129.8	159.5
1986	373.8	362.7	17.4	19.0	128.1	162.6

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Selected Industry Groups, 1970 to Date

(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1970	$ 54.9	$ 47.0	$ 17.4	$ 50.0	$ .9
1971	56.1	48.5	22.5	67.4	.9
1972	70.9	54.1	21.0	75.5	1.4
1973	89.2	64.7	26.7	91.5	2.6
1974	105.3	67.8	29.9	84.1	2.6
1975	92.7	62.8	26.9	82.2	1.3
1976	107.4	77.0	31.9	111.7	2.2
1977	126.7	92.5	40.8	134.1	3.0
1978	154.5	106.8	54.9	158.2	4.3
1979	174.6	121.6	68.3	154.2	5.6
1980	180.6	135.6	73.1	129.0	4.8
1981	200.5	144.7	64.1	139.6	2.9
1982(r)	170.1	154.9	70.7	136.1	1.5
1983(r)	179.9	168.5	87.7	172.0	1.7
1984(r)	215.4	198.4	92.1	200.5	2.9
1985(r)	213.0	200.4	101.0	205.4	2.5
1986	199.6	207.8	104.5	214.1	2.1

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly); NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS

Selected Industry Groups, 1970 to Date

(Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1970	$22.1	$16.6	$ 26.3	$ 8.6	$ .7
1971	22.2	17.2	26.4	9.6	.6
1972	27.5	18.0	26.2	11.5	1.0
1973	38.9	22.0	27.8	17.4	2.1
1974	51.9	24.0	30.4	20.6	2.6
1975	48.9	22.7	28.1	18.4	1.5
1976	50.8	25.9	28.9	19.6	1.6
1977	55.4	30.1	37.3	19.1	2.3
1978	66.8	36.5	54.8	26.0	3.6
1979	75.0	42.2	75.1	27.0	5.4
1980	74.8	49.3	89.7	27.9	5.5
1981	73.8	53.8	89.1	27.0	3.3
1982(r)	57.7	63.7	96.8	29.3	1.2
1983(r)	58.7	73.1	109.6	34.3	1.0
1984(r)	63.8	84.1	122.7	29.3	1.7
1985(r)	61.8	91.8	132.7	24.1	1.7
1986	55.5	93.9	138.2	23.1	1.2

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly); NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1970 to Date
(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group: Primary Metals	By Industry Group: Fabricated Metal Products	By Capital Goods Industries: Nondefense	By Capital Goods Industries: Defense
1970	$ 634.0	$ 338.6	$ 52.0	$ 44.5	$ 87.5	$ 23.8
1971	671.1	359.7	51.6	45.7	88.5	19.7
1972	756.3	408.3	58.4	51.5	97.9	20.2
1973	875.2	476.2	72.7	58.9	115.8	21.4
1974	1,017.5	530.7	95.6	67.3	135.9	21.3
1975	1,039.1	523.9	80.8	68.5	139.6	23.0
1976	1,185.6	608.3	93.0	77.4	151.4	26.7
1977	1,358.4	711.2	103.2	90.0	174.5	30.1
1978	1,522.9	814.2	118.1	101.3	207.6	31.2
1979	1,727.2	912.7	137.4	113.6	247.1	32.9
1980	1,852.7	930.6	133.9	116.2	272.4	40.6
1981	2,017.5	1,006.5	141.9	123.7	297.7	48.2
1982(r)	1,960.2	952.2	104.7	119.4	281.0	60.4
1983(r)	2,054.9	1,019.5	108.5	122.1	271.8	74.5
1984(r)	2,254.4	1,159.5	119.1	135.9	311.1	83.8
1985(r)	2,279.1	1,187.2	110.3	139.6	323.8	96.8
1986	2,273.3	1,201.7	101.7	136.0	321.8	106.9

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1970 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1970	$ 56.5	$ 47.2	$ 42.5	$ 32.0	$13.1	$1.4
1971	56.0	48.0	58.2	30.6	13.5	1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977	122.2	88.4	117.7	49.2	28.9	2.3
1978	143.2	100.5	132.0	56.8	33.7	3.0
1979	166.5	116[illegible]	131.4	70.2	37.7	3.9
1980	180.7	128.6	104.6	82.0	44.1	4.7
1981	201.5	140.2	117.0	88.2	48.3	5.1
1982(r)	187.9	147.9	112.3	89.1	51.8	3.6
1983(r)	179.0	159.2	147.3	96.8	53.6	1.8
1984(r)	210.4	187.6	179.3	101.9	59.4	2.3
1985(r)	215.1	192.7	188.5	112.8	61.[illegible]	2.5
1986	205.8	205.6	194.7	119.4	60.9	2.6

r – Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982 – 1986" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1980 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1980	1981	1982(r)	1983(r)	1984(r)	1985(r)	1986
Metalworking Machinery Industry (SIC 354) (a)							
Jan.	$ 822	$ 885	$ 923	$ 624	$ 615	$ 599	$ 629
Feb.	994	1,091	960	628	696	719	762
Mar.	1,087	1,150	993	649	767	860	845
Apr.	898	1,018	821	595	706	671	703
May	933	971	791	596	710	716	696
June	1,077	1,114	889	610	733	825	819
July	763	860	718	530	619	694	604
Aug.	835	930	761	598	659	673	629
Sept.	1,009	1,115	767	719	779	833	839
Oct.	1,021	1,029	674	699	800	850	873
Nov.	1,002	912	650	649	686	732	768
Dec.	1,077	943	664	658	816	856	756
TOTAL	$11,518	$12,018	$9,611	$7,555	$8,586	$9,028	$8,923
Machine Tools (SIC 3541 & 3542) (b)							
Jan.	$ 331	$ 389	$ 384	$ 153	$ 113	$ 138	$ 146
Feb.	355	422	360	158	147	166	203
Mar.	460	477	411	176	189	228	249
Apr.	343	448	303	151	159	170	210
May	375	411	296	136	210	177	230
June	476	509	409	183	204	239	312
July	327	367	250	112	194	195	190
Aug.	311	325	257	113	164	216	151
Sept.	411	442	276	132	211	244	208
Oct.	440	407	201	145	208	199	243
Nov.	400	408	194	148	212	199	167
Dec.	463	491	264	238	276	347	271
TOTAL	$ 4,692	$ 5,096	$3,604	$1,845	$2,286	$2,545	$2,579

r – Revised.

(a) Adjusted for trading-day and calendar month variation.
(b) Shipments of new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982 - 86" and Series M3-1 (monthly). NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled almost $2.5 billion by 1975, dropped by 16% in 1976, and grew to almost $5.1 billion in 1981. In 1982 shipments fell 29% and declined another 49% to $1.8 billion in 1983. In 1984 and 1985 shipments rose 24% and 11%, respectively, while shipments in 1986 increased a marginal 1%.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1980 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1980	1981	1982(r)	1983(r)	1984(r)	1985(r)	1986
Metalworking Machinery Industry (SIC 354) (a)							
Jan.	$ 1,056	$ 898	$ 684	$ 480	$ 703	$ 707	$ 638
Feb.	1,210	948	603	589	772	825	708
Mar.	1,282	1,059	596	579	780	968	793
Apr.	921	880	540	585	732	787	714
May	860	742	560	626	806	774	738
June	1,064	891	754	648	759	943	684
July	764	648	524	593	982	862	677
Aug.	664	807	635	722	806	684	640
Sept.	943	781	516	672	849	832	782
Oct.	900	790	557	775	728	842	736
Nov.	806	648	511	686	724	577	702
Dec.	970	475	524	561	896	465	578
TOTAL	$11,440	$9,567	$7,004	$7,516	$9,537	$9,266	$8,390
Machine Tools (SIC 3541 & 3542) (b)							
Jan.	—	$ 291	$ 205	$ 92	$ 189	$ 211	$ 191
Feb.	—	280	164	98	203	238	210
Mar.	$1,517	350	138	126	208	279	215
Apr.	—	320	151	119	253	184	193
May	—	229	106	135	320	223	206
June	1,335	318	126	145	192	235	201
July	—	192	107	175	313	200	170
Aug.	—	214	87	137	201	185	154
Sept.	818	187	87	156	286	174	135
Oct.	—	216	119	203	284	230	180
Nov.	—	196	88	160	212	195	133
Dec.	984	152	121	151	255	175	137
TOTAL	$4,754	$2,945	$1,498	$1,696	$2,916	$2,528	$2,125

r – Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Net new orders for new machine tools and accessories ordered with them.

Note: Individual items may not add to totals due to rounding.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-86" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders. These generally follow the overall movement of the economy but the cycles involved are much more pronounced. For example, in 1975 new orders were only 45% of the level experienced in 1973. However, the economic recovery following the 1974 recession was especially strong in the machine tool sector and by 1979 orders were running at record levels, well in excess of $5 billion per year. This strength in machine tool orders continued into early 1980, and then began a long, steady decline until late 1982. As a mark of the severity of the recession, machine tool orders for 1982 were only 27% of their 1979 record total. Monthly order placements demonstrated gradual improvement throughout 1983, and in 1984 there was a dramatic year-to-year increase of 72%. However, orders fell 13% in 1985 and another 16% in 1986. The failure of the industry to experience a recovery in step with the general economy has threatened the future of many domestic machine tool building firms.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1980 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1980	1981	1982(r)	1983(r)	1984(r)	1985(r)	1986
Metalworking Machinery Industry (SIC 354) (a)							
Jan.	$7,721	$7,422	$4,806	$2,294	$2,487	$3,458	$3,597
Feb.	7,937	7,279	4,449	2,255	2,563	3,564	3,543
Mar.	8,132	7,188	4,052	2,185	2,576	3,672	3,491
Apr.	8,155	7,050	3,771	2,175	2,602	3,788	3,502
May	8,082	6,821	3,540	2,205	2,696	3,846	3,544
June	8,069	6,598	3,405	2,243	2,724	3,964	3,409
July	8,070	6,386	3,211	2,306	3,087	4,132	3,482
Aug.	7,899	6,263	3,085	2,430	3,234	4,143	3,493
Sept.	7,833	5,929	2,834	2,383	3,304	4,142	3,436
Oct.	7,712	5,690	2,717	2,459	3,232	4,134	3,299
Nov.	7,516	5,426	2,578	2,496	3,270	3,979	3,233
Dec.	7,409	4,958	2,438	2,399	3,350	3,588	3,055
Machine Tools (SIC 3541 & 3542) (b)							
Jan.	—	$5,353	$3,122	$1,133	$1,121	$1,748	$1,702
Feb.	—	5,211	2,926	1,072	1,176	1,840	1,710
Mar.	$5,760	5,083	2,653	1,021	1,196	1,871	1,676
Apr.	—	4,956	2,500	989	1,290	1,885	1,660
May	—	4,773	2,310	988	1,400	1,930	1,636
June	5,902	4,583	2,027	950	1,388	1,927	1,526
July	—	4,408	1,883	1,013	1,507	1,932	1,506
Aug.	—	4,296	1,713	1,037	1,544	1,900	1,509
Sept.	5,770	4,042	1,524	1,062	1,619	1,830	1,436
Oct.	—	3,852	1,442	1,119	1,695	1,861	1,373
Nov.	—	3,639	1,337	1,131	1,695	1,857	1,339
Dec.	5,451	3,300	1,194	1,045	1,675	1,658	1,204

r – Revised.

(a) Adjusted for trading-day and calendar month variation.
(b) Net new orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-86" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

Because they must incorporate a variety of customer-specified options, machine tools are generally "built to order" rather than being built for inventory. This order-taking procedure results in the backlog of unfilled orders, machines ordered by customers but not yet shipped, for which statistics appear above. The backlog of unfilled orders for machine tools, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. The slack pace of the economy since then saw the accumulated volume of unfilled orders drop to just $1.0 billion by the end of 1983. The order recovery in 1984 led to a sharp increase for the year but total outstanding unfilled order levels in 1984, 1985 and 1986 were nonetheless in line with prevailing shipping rates.

PRODUCER PRICE INDEXES

For Selected Machine Tool Materials and Components

1967 = 100, unless otherwise indicated

Commodity	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Finished Goods	180.6	194.6	216.1	247.0	269.8	280.7	285.2	291.1	293.7	289.7
All Commodities	194.2	209.3	235.6	268.8	293.4	299.3	303.1	310.3	308.7	299.8
Industrial Commodities	195.1	209.4	236.5	274.8	304.1	312.3	315.7	322.6	323.8	312.2
Manufactured Durables	188.1	204.7	226.1	250.8	269.7	279.8	287.3	293.9	298.1	300.8
Industrial Power, 500 KW Demand	257.0	279.5	305.3	368.1	422.2	473.1	487.8	512.8	533.4	541.5
Lubricating Oil Materials	304.3	349.5	477.9	756.4	873.6	877.2	787.5	796.5	NA	NA
Prepared Paint	182.4	192.3	204.4	235.3	249.8	262.8	264.7	272.5	276.8	281.2
Iron and Steel	230.4	253.6	283.5	305.2	333.8	339.0	343.4	356.9	355.3	342.9
Steel Mill Products	229.9	254.5	280.4	302.7	337.6	349.5	352.8	366.0	366.1	348.7
Semi-finished Steel Products	243.6	270.5	294.3	325.6	359.3	370.2	370.6	371.4	371.2	366.6
Finished Steel Products	229.0	253.5	279.5	301.2	336.2	348.0	349.9	363.0	363.7	347.5
Foundry and Forge Shop Products	230.5	249.5	277.1	310.0	329.8	345.5	351.1	360.6	363.4	363.5
Gray Iron Castings	211.1	225.1	245.5	270.7	NA	NA	NA	NA	NA	NA
Steel Castings	234.4	257.3	291.9	327.8	NA	NA	NA	NA	NA	NA
Gray & Ductile Iron Cast Dec. 1980 = 100	NA	NA	NA	NA	105.2	110.5	110.5	111.6	114.2	114.7
Nonferrous Metals	195.4	207.8	261.7	305.0	285.8	263.6	276.1	277.1	262.5	259.6
Primary Metal Refinery Shapes	206.0	218.3	295.4	377.2	326.1	284.3	303.7	288.1	266.1	266.8
Mill Shapes	213.1	229.9	270.4	292.7	304.1	301.5	310.8	321.8	310.3	301.4
Aluminum Shapes	202.1	226.5	247.3	266.7	293.4	298.5	305.2	334.3	321.9	306.2
Wire and Cable	156.1	155.2	186.5	217.6	207.5	202.5	204.0	202.3	204.4	206.1
Metalworking Machinery and Equipment	198.5	217.0	241.3	274.4	301.3	320.9	326.5	334.0	341.9	348.0
Cutting Tools & Access.	172.0	187.5	206.8	233.2	256.3	271.1	274.7	279.3	286.5	291.5
Abrasive Products	193.4	205.6	223.4	252.5	276.5	296.8	304.5	306.7	314.4	316.7
Metal Cutting Machine Tools	206.3	231.5	266.9	313.5	344.8	368.5	376.3	385.7	395.3	403.8
Metal Forming Machine Tools	232.6	262.8	300.1	346.7	380.3	404.7	415.8	423.8	433.1	439.9
General Purpose Machy. & Equipment	201.8	216.6	236.4	264.6	288.7	304.0	308.2	314.1	321.3	325.8
Pumps, Compressors, & Equipment	211.6	228.0	249.1	287.7	324.5	347.3	347.4	349.5	356.4	361.6
Fluid Power Equipment, Dec. 1970 = 100	152.7	163.3	176.2	199.6	222.3	244.3	252.9	259.1	264.1	268.3
Fluid Power Pumps, Dec. 1970 = 100	152.0	161.7	174.9	198.6	223.9	245.1	257.2	255.0	259.6	265.5
Fluid Power Valves, Dec. 1971 = 100	142.6	150.3	162.1	180.5	200.1	222.4	226.0	234.7	239.3	242.6
Cylinders, Dec. 1971 = 100	151.1	164.3	177.7	205.5	230.1	255.9	273.0	NA	NA	NA
Cylinders, June 1984 = 100	NA	NA	NA	NA	NA	NA	NA	100.2	101.1	102.4
Fluid Power Hose and Tube Fittings,Dec. 1972 = 100	151.3	166.5	178.0	204.3	223.5	238.4	239.5	245.4	252.5	255.7
Mechanical Power Transmission Equipment	196.6	213.0	234.6	264.0	294.8	312.4	315.8	326.1	338.0	345.2
Miscellaneous General Purpose Equipment	206.9	222.7	246.4	279.4	307.0	323.5	325.0	334.5	343.7	348.4
Ball & Roller Bearings	191.4	206.3	227.0	265.1	304.8	331.5	331.7	341.2	351.1	355.8
Electrical Machinery and Equipment	154.1	164.9	178.9	201.7	220.2	231.6	240.1	248.7	253.8	257.6
Motors, Generators, Motor Generator Sets	202.2	218.1	234.6	266.3	296.1	309.8	329.5	340.0	351.0	351.4
Electric Motors	192.5	207.3	229.0	252.3	278.8	293.9	NA	NA	NA	NA
Integral Elec. Motors, AC June 1983 = 100	NA	NA	NA	NA	NA	NA	106.9	109.3	110.7	106.1
Transformers and Power Regulators	146.5	155.2	164.3	182.7	208.8	221.7	223.3	227.4	232.8	234.2
Switchgear, Switchboard, etc. Equipment	173.9	184.0	200.0	233.0	250.8	263.8	272.4	277.0	281.3	285.1
Electronic Components and Accessories	119.5	126.9	135.8	156.3	168.1	176.1	183.6	193.2	197.9	201.6

NA – Not Available.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

NATIONAL DEFENSE PURCHASES
IMPLICIT PRICE DEFLATORS
By Major Type of Product, 1975 to Date
(Index 1982 = 100)

Year	Total Purchases	Durable Goods	Non-Durable Goods	Services (a)	Structures	Compensation
1975	56.5	59.3	41.6	−0.8	59.5	57.7
1976	59.7	61.7	43.4	−0.6	60.4	61.4
1977	63.5	64.6	46.3	−0.1	64.6	65.2
1978	68.6	70.1	50.3	−0.2	72.9	69.9
1979	71.1	75.5	61.9	−0.1	84.4	75.4
1980	84.7	84.9	87.9	0.3	95.4	82.8
1981	93.8	94.4	102.0	0.2	99.4	92.0
1982	100.0	100.0	100.0	0.0	100.0	100.0
1983	103.8	104.9	92.9	0.1	101.2	105.0
1984	107.6	108.9	89.8	0.1	105.5	109.8
1985(r)	111.4	111.8	89.0	−0.9	110.4	114.5
1986	112.8	113.2	71.6	−0.8	115.0	117.8

r – Revised.

(a) Services excluding Compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

NATIONAL DEFENSE PURCHASES
By Major Type of Product, 1975 to Date

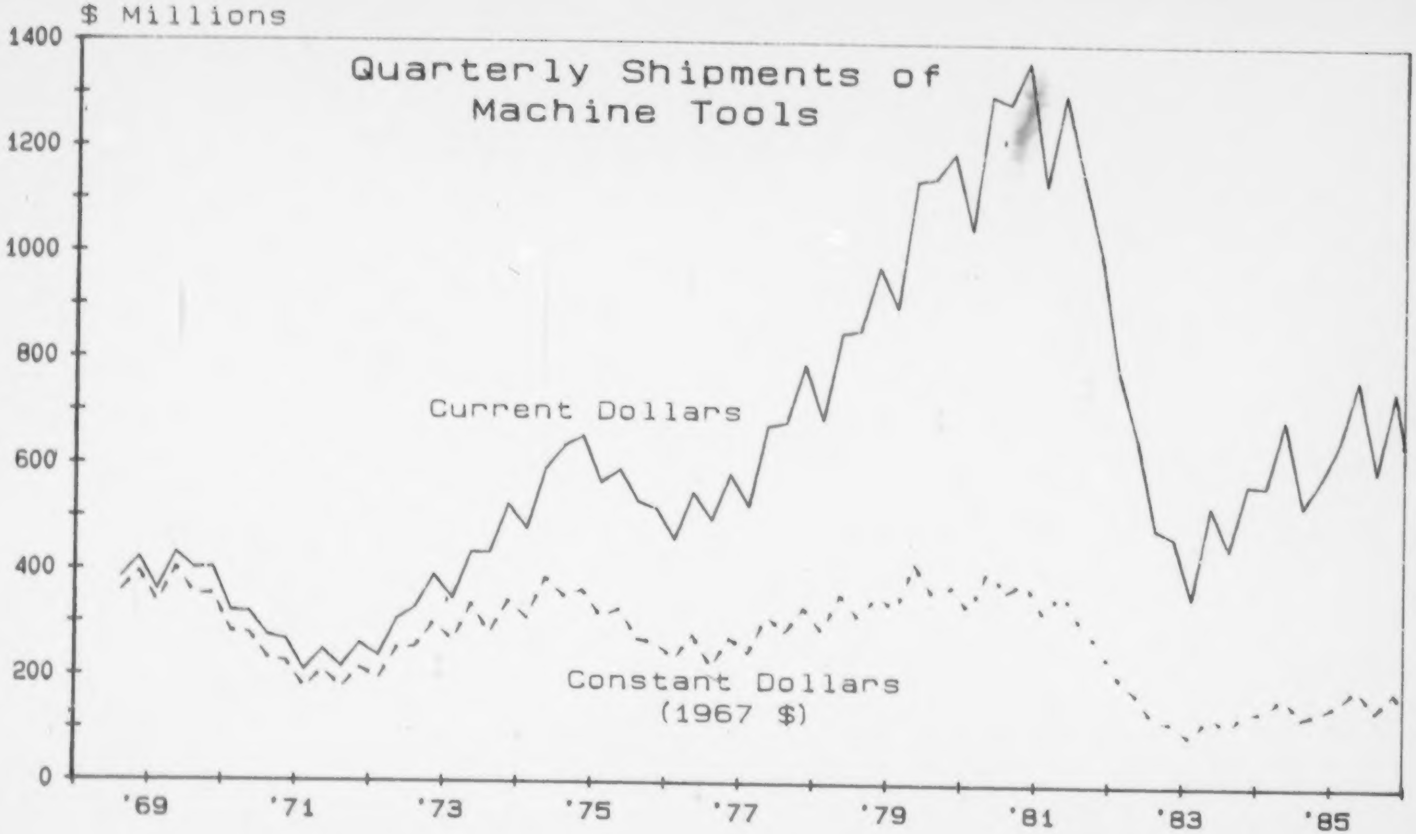
Year	Total Purchases	Durable Goods	Non-Durable Goods	Services (a)	Structures	Compensation
In Current Dollars (Billions)						
1975	$ 89.6	$17.4	$ 5.4	$17.4	$2.3	$47.1
1976	93.4	18.4	4.7	18.9	2.1	49.3
1977	100.9	21.9	5.1	19.7	2.4	51.8
1978	108.9	23.6	5.6	21.4	2.5	55.8
1979	121.9	28.7	6.7	24.3	2.5	59.7
1980	142.7	33.0	10.9	29.7	3.1	66.0
1981	167.5	39.8	12.7	36.2	3.2	75.6
1982	193.8	49.2	13.6	43.1	3.9	84.0
1983	215.7	58.8	12.6	56.3	4.7	89.5
1984	237.0	68.9	12.0	66.0	5.0	94.8
1985(r)	259.4	74.9	12.2	65.0	6.1	101.1
1986	277.6	82.5	10.9	72.9	6.8	104.6
In Constant 1982 Dollars (Billions)						
1975	$161.1	$30.6	$13.2	$31.6	$3.8	$81.9
1976	157.5	30.6	11.3	32.0	3.4	80.2
1977	159.2	34.3	11.2	30.5	3.6	79.5
1978	160.7	35.0	11.4	31.0	3.4	79.9
1979	164.3	38.9	10.8	32.5	2.9	79.1
1980	171.2	40.3	12.4	35.6	3.3	79.7
1981	180.3	43.3	12.5	39.2	3.2	82.1
1982	193.8	49.2	13.6	43.1	3.9	84.0
1983	207.3	56.4	13.5	47.5	4.6	85.2
1984	220.3	64.6	13.3	51.4	4.7	86.3
1985(r)	235.7	70.4	13.6	58.0	5.5	88.3
1986	250.0	77.2	14.6	63.5	5.9	88.8

r – Revised.

(a) Services excluding Compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

The estimates in the above table are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.


Quarterly Shipments of
Machine Tools
$ Millions
1400
1200
1000
800
600
400
200
0
'69
'71
'73
'75
'77
'79
'81
'83
'85
Current Dollars
Constant Dollars
(1967 $)

PRODUCER PRICES INDEXES FOR MACHINE TOOLS

1948 to Date

1967 = 100

Year	All Commodities	Durable Manufactures	Total(a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1948	82.8	65.3	39.9	38.8	43.1
1949	78.7	67.3	47.2	41.2	45.1
1950	81.8	69.6	45.5	44.2	49.0
1951	91.1	76.3	52.7	51.6	55.7
1952	88.6	76.7	56.1	55.3	58.5
1953	87.4	78.4	56.9	55.8	59.8
1954	87.6	79.4	57.2	56.1	60.4
1955	87.8	82.2	60.1	58.3	65.2
1956	90.7	87.5	68.1	66.3	73.7
1957	93.3	90.9	72.8	71.3	77.8
1958	94.6	92.1	74.0	72.7	76.9
1959	94.8	94.0	75.2	74.3	77.5
1960	94.9	94.1	77.4	76.5	79.6
1961	94.5	93.6	79.0	78.8	79.5
1962	94.8	93.5	80.8	80.5	81.4
1963	94.5	93.6	81.1	80.8	81.9
1964	94.7	94.6	84.1	83.9	84.4
1965	96.6	95.8	88.6	88.3	89.3
1966	99.8	97.9	94.4	94.1	95.6
1967	100.0	100.0	100.0	100.0	100.0
1968	102.5	103.5	103.3	103.0	104.1
1969	106.5	107.7	107.1	106.8	107.4
1970	110.4	112.0	114.1	113.5	115.6
1971	113.9	117.0	118.2	117.1	121.0
1972	119.1	121.1	121.7	120.2	125.3
1973	134.7	127.4	129.6	128.2	133.0
1974	160.1	148.6	153.9	152.0	161.7
1975	174.9	165.6	180.5	177.1	192.2
1976	182.9	175.5	196.5	190.9	212.9
1977	194.2	188.1	213.3	206.3	232.6
1978	209.3	204.7	238.5	231.5	262.8
1979	235.6	226.1	273.2	266.9	300.1
1980	268.8	250.8	319.0	313.5	346.7
1981	293.4	269.7	353.4	344.8	380.3
1982	299.3	279.8	379.0	368.5	404.7
1983	303.1	287.3	389.0	376.3	415.8
1984	310.3	293.9	398.8	385.7	423.7
1985	308.7	298.1	405.4	395.3	433.1
1986	299.8	300.8	413.7	403.8	439.9

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA net new order weights.

Source: U. S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977," "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES
1948 to Date
(In 1986 Dollars)

	Total Industry (a)		Metal Cutting		Metal Forming	
Year	Current Dollars (Thousands)	1986 Dollars (Thousands)	Current Dollars (Thousands)	1986 Dollars (Thousands)	Current Dollars (Thousands)	1986 Dollars (Thousands)
1948	$ 288,450	$2,954,522	$ 288,450	$3,001,873	—	—
1949	249,150	2,157,330	249,150	2,441,929	—	—
1950	305,550	2,744,543	305,550	2,791,431	—	—
1951	632,250	4,903,063	632,250	4,947,570	—	—
1952	1,125,900	8,202,681	1,125,900	8,221,249	—	—
1953	1,191,200	8,556,242	1,191,200	8,620,016	—	—
1954	891,750	6,371,463	891,750	6,418,700	—	—
1955	670,400	4,558,994	670,400	4,643,302	—	—
1956	1,377,300	8,265,618	945,200	5,756,745	$ 432,100	$2,579,086
1957	1,242,700	6,976,366	900,150	5,097,978	342,550	1,936,843
1958	591,200	3,265,216	438,400	2,435,014	152,800	874,092
1959	616,000	3,347,826	440,600	2,394,565	175,400	995,573
1960	744,000	3,928,609	541,500	2,858,274	202,500	1,119,094
1961	750,900	3,884,635	541,250	2,773,508	209,650	1,160,082
1962	821,250	4,154,021	612,850	3,074,087	208,400	1,126,243
1963	895,750	4,514,186	638,450	3,190,655	257,300	1,381,996
1964	1,164,350	5,658,502	844,650	4,065,117	319,700	1,666,319
1965	1,425,600	6,576,252	1,022,550	4,676,224	403,050	1,985,468
1966	1,685,200	7,295,870	1,221,750	5,242,662	463,450	2,132,569
1967	1,805,950	7,380,865	1,353,200	5,464,163	452,750	1,991,686
1968	1,726,900	6,832,443	1,358,300	5,324,996	368,600	1,557,640
1969	1,597,550	6,096,356	1,192,450	4,508,488	405,100	1,659,226
1970	1,443,050	5,168,887	992,900	3,532,446	450,150	1,712,965
1971	997,900	3,450,434	672,300	2,318,276	325,600	1,183,742
1972	1,018,700	3,421,097	714,450	2,400,141	304,250	1,068,144
1973	1,501,000	4,733,523	1,073,750	3,382,103	427,250	1,413,144
1974	2,030,550	5,392,368	1,445,850	3,841,055	584,700	1,590,674
1975	2,451,700	5,551,354	1,878,650	4,283,483	573,050	1,311,567
1976	2,059,650	4,283,887	1,482,100	3,134,995	577,550	1,193,359
1977	2,280,750	4,370,090	1,650,800	3,231,161	629,950	1,191,372
1978	3,013,450	5,163,908	2,188,500	3,817,373	824,950	1,380,877
1979	3,876,550	5,799,225	2,930,050	4,432,955	946,500	1,387,423
1980	4,691,750	6,011,057	3,680,800	4,741,038	1,010,950	1,282,720
1981	5,095,600	5,892,979	4,104,500	4,806,825	991,100	1,146,430
1982	3,604,400	3,886,858	2,894,750	3,172,051	709,650	771,375
1983	1,845,050	1,938,485	1,371,500	1,471,724	473,550	501,000
1984	2,285,850	2,342,587	1,606,500	1,681,892	679,350	705,327
1985	2,545,200	2,565,907	1,742,250	1,779,713	802,950	815,559
1986	2,578,500	2,578,500	1,890,300	1,890,300	688,200	688,200

(a) Shipment data not available for metal forming prior to 1956.

Note: 1986 dollar values developed from the Producer Price Index (formerly Wholesale Price Index) for metal cutting and metal forming machine tools.

Source: U. S. Department of Labor, Bureau of Labor Statistics, NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog (monthly)."

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,855,056 and for metal forming is $1,030,527.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the past twenty years. The changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth in recent years has been considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

Since 1975, the overall United States balance of trade has moved from a small surplus to record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining throughout the 1970's. Record high machine tool imports by U.S. manufacturers, combined with relatively small increases in machine tool exports, led to substantial balance of trade deficits in machine tool trade from 1978 through the present. In a little over a decade, the share of the domestic market represented by imports has grown from a negligible amount to over sixty percent of NC machine tool consumption and over fifty percent of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS DOMESTIC PRODUCT
1977 to Date
(Billions of U.S Dollars)

	1977	1978	1979	1980	1981	1982	1983	1984	1985(r)	1986
WORLD	$7,554	$8,906	$10,241	$11,565	$12,636	$12,550	$12,653	$12,822	$13,780	$16,218
Of which:										
United States	1,895	2,134	2,375	2,586	2,908	3,021	3,257	3,727	3,957	4,169
Canada	202	209	232	261	293	301	327	337	348	363
Japan	687	963	998	1,040	1,145	1,063	1,158	1,255	1,325	1,956
Australia	96	110	122	141	162	160	156	228	160	167
Belgium	79	97	111	119	98	86	82	78	81	115
France	384	474	574	655	573	543	517	490	522	724
West Germany	515	640	760	815	683	659	653	614	626	896
Italy	215	262	325	396	353	349	353	348	422	600
Netherlands	112	137	158	169	141	138	132	123	124	171
Spain	121	146	196	212	188	181	159	161	164	229
Sweden	83	91	108	124	113	99	91	95	100	131
Switzerland	61	85	95	102	94	97	97	91	93	135
United Kingdom	254	322	416	535	511	484	457	425	457	549
Saudia Arabia	58	66	71	116	154	153	120	105	91	77
Brazil	176	208	234	250	275	283	210	209	457	549
Mexico	82	103	135	186	240	167	145	163	146	127
U.S.S.R.	1,066	1,152	1,253	1,393	1,587	1,715	1,843	1,958	2,174	2,326E
China	142	179	215	246	231	225	247	274	232	226
PER CAPITA WORLD	$1,777	$2,056	$2,327	$2,583	$2,772	$2,704	$2,680	$2,699	$2,819	$3,298
Of which:										
United States	8,603	9,588	10,554	11,359	12,650	13,019	13,887	15,746	16,584	17,298
Canada	8,682	8,896	9,788	10,910	12,044	12,217	13,124	13,356	13,689	14,538
Japan	6,034	8,381	8,610	8,909	9,734	8,973	9,706	10,458	10,979	14,928
Australia	6,770	7,667	8,380	9,597	10,827	10,541	10,135	11,381	10,130	10,413
Belgium	8,049	9,840	11,275	12,119	9,945	8,763	8,311	7,879	8,186	11,753
France	7,226	8,905	10,734	12,201	10,610	10,016	9,455	8,945	9,490	13,065
West Germany	8,389	10,435	12,365	13,239	11,079	10,699	10,640	10,033	10,259	14,734
Italy	3,815	4,618	5,714	6,930	6,176	6,193	6,208	6,121	7,390	10,506
Netherlands	8,088	9,848	11,227	11,979	9,924	9,624	9,192	8,501	8,568	11,790
Spain	3,324	3,983	5,261	5,658	4,984	4,771	4,154	4,190	4,255	5,905
Sweden	10,007	11,024	13,008	14,940	13,564	11,898	10,888	11,378	12,011	15,840
Switzerland	9,583	13,380	14,992	15,908	14,628	14,897	14,988	13,954	14,312	21,145
United Kingdom	4,555	5,768	7,443	9,562	9,150	8,685	8,100	7,542	8,095	9,718
Saudia Arabia	7,345	8,027	8,276	12,943	16,513	15,815	11,513	12,353	7,920	6,457
Brazil	1,595	1,844	2,024	2,059	2,219	2,232	1,618	1,576	483	310
Mexico	1,268	1,569	1,995	2,687	3,366	2,287	1,932	2,122	2,260	1,859
U.S.S.R.	4,116	4,409	4,757	5,247	5,928	6,352	6,764	7,120	7,795	8,340
China	149	184	219	247	229	221	241	267	222	214

E - Estimate. r - Revised.

(a) Prior to 1981, the world total does not include Bulgaria, Czechoslovakia, East Germany, Poland, Romania, and North Korea. These countries are included after 1980 but the data represents GNP rather than GDP.

(b) Data for the U.S.S.R. series are GNP figures.

Note: GDP measures the total value of final output of a country's economy - that is, of the goods produced and services rendered within its territory by residents and nonresidents for a given period - without regard to its allocation among domestic and foreign claims.

Source: International Monetary Fund, "International Financial Statistics" Department of Commerce, International Trade Administration, Central Intelligence Agency, "Handbook of Economic Statistics," Department of State, and World Bank, "World Population Projections."

INTERNATIONAL INVESTMENT PATTERNS
1977 to Date (r)

	Gross Fixed Capital Formation as Percent of GDP									
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
United States (a)	16.4%	17.5%	17.9%	16.6%	16.4%	15.1%	15.2%	16.1%	16.4%	16.2%
Canada	23.1	22.6	23.0	23.3	24.2	21.8	20.1	19.0	19.4	19.6
Japan	30.2	30.4	31.7	31.6	30.7	29.7	28.3	27.9	27.7	27.8E
Australia	23.8	23.8	23.3	24.2	25.8	25.3	22.8	22.4	23.6	23.3
France	22.9	22.4	22.4	23.0	22.1	21.4	20.2	19.3	19.0	18.8
West Germany	20.2	20.7	21.8	22.7	21.8	20.5	20.6	20.2	19.5	19.3
Italy	19.6	18.7	18.8	24.3	23.8	22.3	22.5	21.2	21.2	20.1
Netherlands	21.1	21.3	21.0	21.0	19.2	18.2	18.2	18.4	18.4	18.6
Spain	21.0	19.9	18.9	19.4	20.3	19.7	18.9	17.9	19.4	20.5
Sweden	20.1	19.4	19.8	20.2	19.2	18.8	18.7	18.6	19.1	18.3
Switzerland	20.7	21.4	21.8	23.8	24.1	23.1	23.3	23.3	23.8	23.8
United Kingdom	18.6	18.5	18.8	18.1	16.4	16.4	16.2	17.4	17.1	17.1

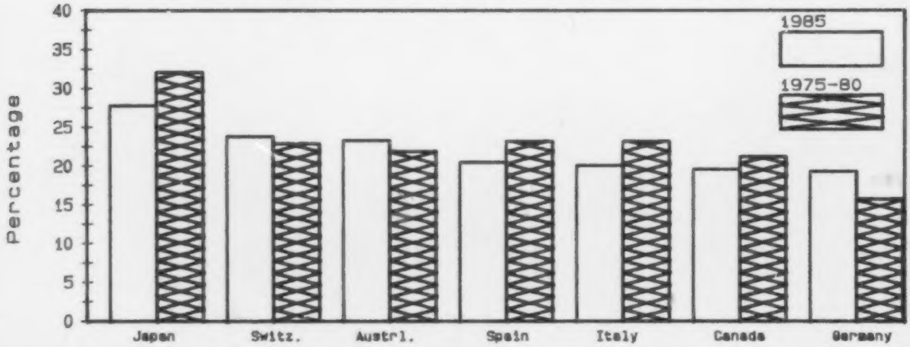
E - Estimate. r - Revised.

(a) This data consists of Private Gross Fixed Capital Formation, i.e. it excludes government capital formation which is included in the other nations' data.

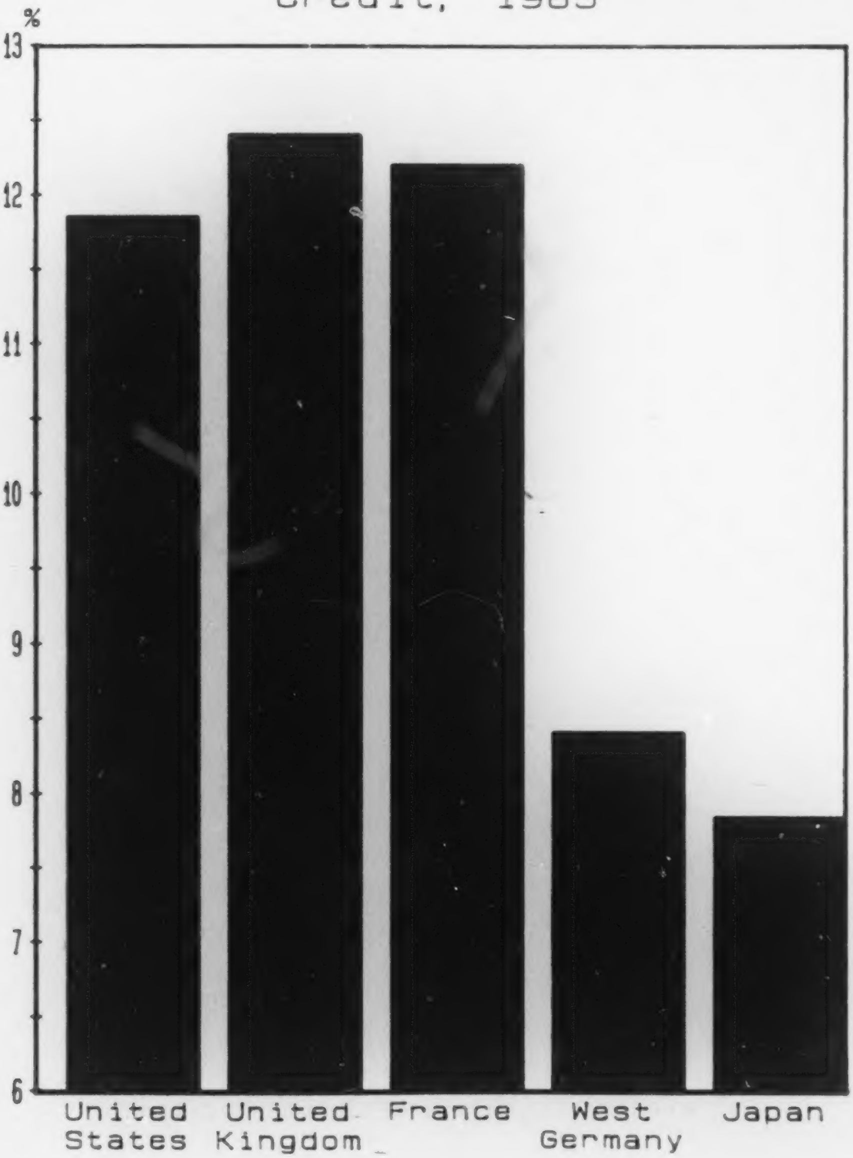
Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

Source: International Monetary Fund, "International Financial Statistics" (Supplement Series No. 8); U.S. Department of Commerce.

INTERNATIONAL INVESTMENT PATTERNS
Fixed Capital Formation as a Percent of GDP



Long Term Interest Rates on Government Supported Export Credit, 1985



U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY—YEAR END 1985

(Billions of U.S. Dollars)

	Total	Manufacturing	Services	Petroleum	Other
Developed Countries	$172.8	$75.9	$3.8	$36.6	$56.5
Canada	46.4	22.1	0.8	9.5	14.0
Europe	106.8	45.2	2.7	22.6	36.3
European Community	82.1	41.5	1.9	16.7	22.0
United Kingdom	34.0	12.6	0.8	9.6	11.0
France	7.8	5.1	0.2	0.6	1.9
West Germany	16.7	10.7	Z	2.6	3.4
Other EEC	23.5	13.2	0.8	D	D
Other Europe	24.7	3.7	0.8	5.9	14.3
Japan	9.1	4.[illegible]	0.1	2.2	2.2
Australia, New Zealand, South Africa	10.5	3.9	0.2	2.3	4.1
Developing Countries	54.5	19.7	1.5	17.3	16.0
Latin America	29.5	15.3	0.5	5.3	8.4
Middle East (b)	5.1	0.5	0.5	2.3	1.8
Other Africa (c)	5.0	0.4	0.1	3.5	1.0
Other Asia and Pacific	14.9	3.5	0.4	6.2	4.8
Other Countries	5.4	—	—	4.4	1.0
Total	$232.7	$95.6	$15.1	$58.3	$63.7

D - Withheld to avoid disclosure. Z - Less than $50 million.

(a) Book value.
(b) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.
(c) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1986.

INDUSTRIAL PRODUCTION (a,r)

1966 to Date

(1980 = 100)

Year	United States	Canada	Japan	EEC(b)	United Kingdom	France	West Germany	Italy
1966	66.5	59.4	36.2	[illegible].2	84.6	61.0	65.0	55.5
1967	68.0	61.5	43.3	[illegible]4.2	85.5	62.0	63.0	60.0
1968	72.3	65.9	50.7	68.9	91.0	65.0	69.0	63.9
1969	75.6	70.1	58.8	75.5	93.4	71.0	79.0	66.4
1970	73.3	71.3	66.9	79.1	93.5	75.0	83.0	72.1
1971	74.6	73.8	68.6	80.9	93.6	80.0	85.0	72.0
1972	81.4	79.4	73.6	84.5	95.7	84.0	88.0	75.2
1973	88.3	87.8	84.6	90.8	102.7	90.0	92.0	82.5
1974	88.0	90.6	81.2	91.3	98.7	92.0	90.0	86.2
1975	80.1	85.2	72.3	85.2	93.9	86.0	84.0	78.3
1976	88.7	90.2	80.4	91.5	5.9	93.0	91.0	87.9
1977	93.9	92.5	83.7	93.6	100.1	95.0	93.0	88.9
1978	99.4	95.0	89.0	96.1	103.3	97.0	95.0	88.8
1979	101.9	100.7	95.5	100.6	107.2	99.0	100.0	94.7
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	102.2	101.0	101.0	97.6	96.6	98.0	98.0	98.5
1982	94.9	90.2	101.3	96.1	98.4	98.0	95.0	95.4
1983	100.5	95.3	104.9	97.0	101.9	99.0	95.0	92.3
1984	112.1	103.7	116.5	99.7	103.2	100.0	98.0	95.2
1985	114.6	108.3	121.9	103.2	108.1	101.0	103.0	96.5
1986	114.0	104.0E	121.5	102.8E	109.7	102.0	105.0	99.2

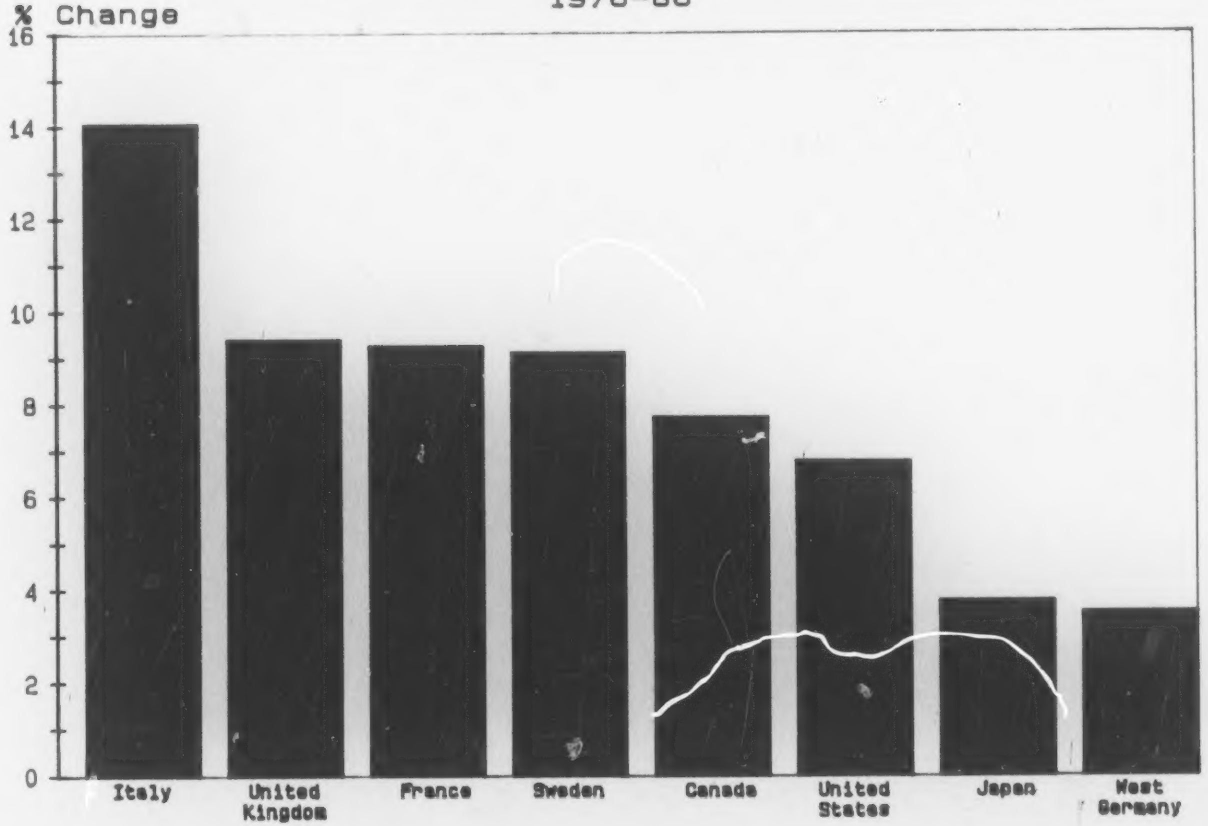
E - Estimate. r - Revised.

(a) Excludes construction.
(b) Data for the European Economic Community (EEC) on this table contains statistics for Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, and West Germany, and also includes Greece after 1980.

Source: International Monetary Fund, "International Financial Statistics," and NMTBA.

Consumer Prices

Average Annual Percent Change
1976-86



CONSUMER PRICES
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1965	38.2	38.2	32.4	22.1	32.2	54.0	23.6	33.3
1966	39.4	39.6	34.0	23.0	33.0	55.9	24.2	35.4
1967	40.5	41.1	35.4	23.6	33.9	56.8	25.1	37.0
1968	42.2	42.7	37.3	24.7	35.5	57.8	25.5	37.7
1969	44.5	44.7	39.3	26.1	37.6	58.9	26.1	38.7
1970	47.1	46.1	42.3	27.7	39.9	60.9	27.4	41.4
1971	49.1	47.5	44.9	30.3	42.1	64.0	28.8	44.5
1972	50.8	49.7	46.9	32.5	44.7	67.6	30.4	47.2
1973	53.9	53.5	52.4	35.5	47.9	72.3	33.7	50.3
1974	59.8	59.3	65.2	41.1	54.5	77.4	40.1	55.3
1975	65.3	65.7	72.9	51.1	60.9	82.0	46.9	60.7
1976	69.1	70.7	79.7	59.6	66.8	85.5	54.8	67.0
1977	73.6	76.3	86.1	69.0	73.0	88.7	64.1	74.6
1978	79.2	83.2	89.4	74.7	79.4	91.1	71.9	82.0
1979	88.1	90.7	92.6	84.8	87.9	94.9	82.5	87.9
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981(r)	110.4	112.4	104.9	111.9	113.4	106.3	119.5	112.1
1982(r)	117.1	124.6	107.8	121.5	126.8	111.9	139.2	121.7
1983(r)	120.9	131.8	109.9	127.1	139.0	115.6	159.5	132.6
1984(r)	126.1	137.5	112.3	133.4	149.3	118.4	176.8	143.2
1985(r)	130.5	143.0	114.6	141.5	157.9	121.0	193.0	153.8
1986	133.1	148.9	115.3	146.4	161.9	120.7	204.3	160.3

r - Revised.

Source: International Monetary Fund, "International Financial Statistics."

WHOLESALE PRICES
(1980 = 100)

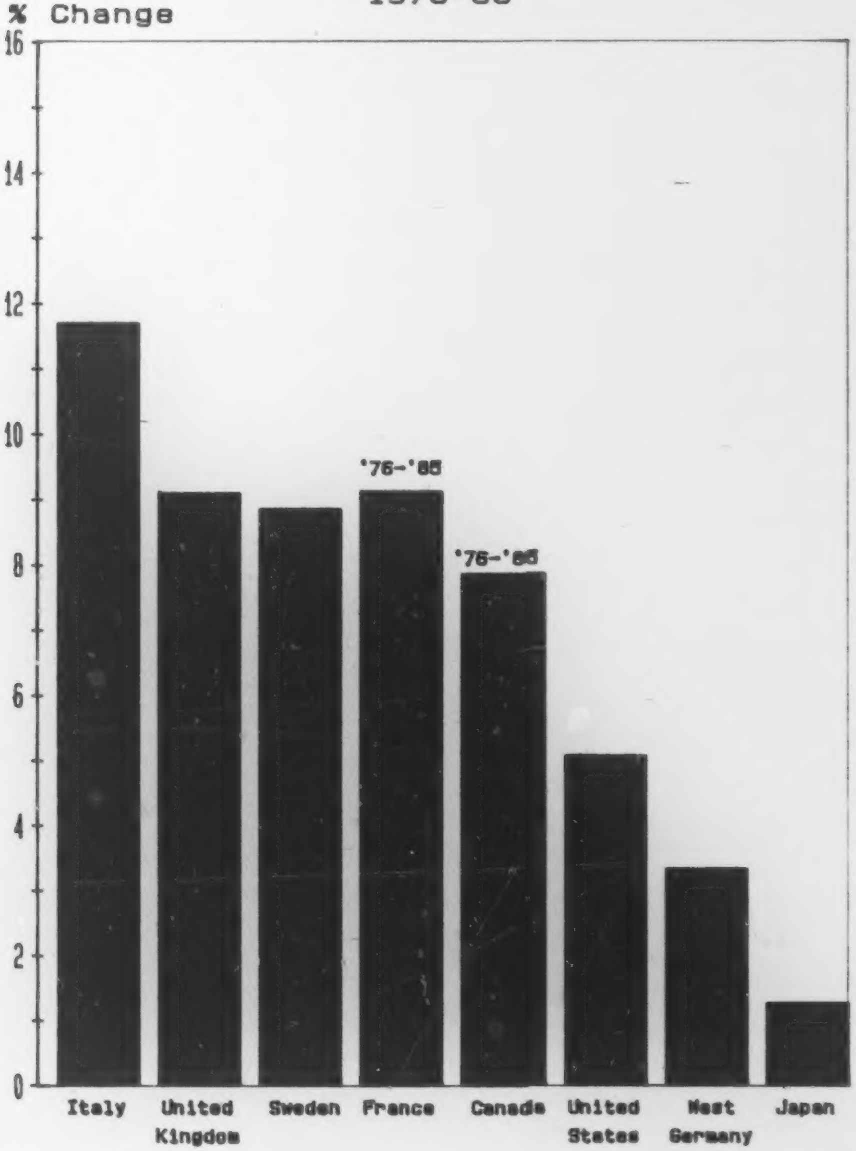
Year	United States	Canada(a)	Japan	United Kingdom(b)	France(c)	West Germany(d)	Italy	Sweden(e)
1965	36.0	34.9	43.5	22.1	38.5	56.8	21.1	NA
1966	37.2	35.9	44.5	22.7	39.6	57.8	21.4	NA
1967	37.2	36.6	45.3	24.4	39.3	57.3	21.4	NA
1968	38.2	37.3	45.7	25.2	38.6	56.9	21.5	35.0
1969	39.7	38.7	46.7	26.2	42.8	57.9	22.3	36.0
1970	41.1	39.7	48.4	28.2	46.0	60.8	24.0	38.0
1971	42.4	40.4	48.0	30.6	46.9	63.4	24.8	39.0
1972	44.3	42.2	48.4	32.2	49.1	65.1	25.8	41.0
1973	50.1	47.0	56.0	34.6	56.3	69.4	30.2	46.0
1974	59.6	55.9	73.7	42.7	72.7	78.7	42.5	57.0
1975	65.1	62.2	75.9	52.1	68.6	82.3	46.1	61.0
1976	68.1	65.4	79.7	61.1	73.6	85.4	57.1	66.0
1977	72.3	70.5	81.2	72.0	77.7	87.7	66.5	73.0
1978	77.9	77.0	79.1	79.1	81.1	88.7	72.1	78.0
1979	87.6	88.1	84.9	87.7	91.9	93.0	83.3	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.1	110.2	101.4	109.6	111.0	107.8	117.4	111.0
1982(r)	111.3	116.8	103.2	118.0	123.3	114.1	133.7	125.0
1983(r)	112.7	120.9	100.9	124.4	136.9	115.8	140.7	139.0
1984(r)	115.4	125.8	100.7	132.1	155.1	119.2	161.9	150.0
1985(r)	114.9	129.1	99.5	139.4	161.3	121.9	173.8	158.0
1986	111.5	NA	90.2	145.7	NA	118.3	172.3	154.0

NA - Not Available. r - Revised.

(a) Industrial selling prices.
(b) Manufacturing output prices.
(c) Industrial goods prices.
(d) Industrial products prices.
(e) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics."

Wholesale Prices
Average Annual Percent Change
1976-86



UNIT VALUE OF EXPORTS
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1969	36.2	33.0	56.9	24.6	37.8	63.4	21.4	34.0
1970	38.2	34.1	59.5	26.4	41.7	61.2	22.4	37.0
1971	39.4	34.4	60.7	27.9	44.1	63.5	23.6	39.0
1972	40.7	35.5	59.9	29.5	44.6	65.4	24.3	41.0
1973	47.4	40.5	63.6	33.2	49.0	68.4	28.8	45.0
1974	60.5	53.7	85.4	42.4	61.8	79.4	40.8	57.0
1975	67.6	59.5	87.4	51.9	65.2	86.2	45.3	66.0
1976	69.9	60.9	86.9	62.1	71.2	89.7	55.3	70.0
1977	72.4	64.8	87.1	72.1	78.2	85.9	65.9	74.0
1978	77.4	71.0	82.2	79.0	82.2	86.7	70.7	78.0
1979	88.1	86.0	89.8	87.5	90.2	91.3	82.8	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.2	106.3	103.0	108.8	113.0	106.3	122.3	109.0
1982(r)	110.4	107.3	108.4	116.6	129.0	110.9	141.7	122.0
1983(r)	111.6	107.4	101.1	125.7	142.0	112.4	151.5	136.0
1984(r)	113.1	112.3	100.7	136.0	158.8	116.3	166.0	146.0
1985(r)	112.2	114.2	100.7	143.4	168.3	120.8	179.4	151.0
1986	112.5	110.3	85.5	147.0	NA	116.8	171.1	NA

r - Revised. NA - Not Available.

Source: International Monetary Fund, "International Financial Statistics."

SOVIET UNION FOREIGN TRADE (a)
1967 to Date
(Millions of U.S. Dollars)

	Exports			Imports		
Year	Total	Communist Countries (b)	Non-communist Countries	Total	Communist Countries (b)	Non-communist Countries
1967	$ 9,652	$ 6,377	$ 3,275	$ 8,537	$ 5,946	$ 2,591
1968	10,634	7,134	3,500	9,410	6,367	3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,918	10,398	4,788	14,368	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50,798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	68,477	36,424	32,052
1981	78,809	43,044	35,764	72,631	36,905	35,727
1982	86,940	46,985	39,955	77,644	42,415	35,229
1983	91,653	50,914	40,739	80,440	45,484	34,957
1984	91,492	51,790	39,702	80,352	47,010	33,342
1985	86,400	52,800	33,600	82,400	50,300	32,100
1986	97,046	64,995	32,051	88,873	59,425	29,448

(a) Exports and imports are F.O.B.

(b) Up to 1980, the following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic. After 1980 the following are included in the category: Bulgaria, China, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Korea, Laos, Mongolian People's Republic, Vietnam, and Yugoslavia.

Source: U.S. Department of Commerce "Overseas Business Reports," and U.S. Department of State.

WORLD TRADE (a)

(Billions of U.S. Dollars)

	1983		1984		1985		1986(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
United States(b)	$ 201	$270	$ 218	$341	$ 213	$ 362	$ 217	$ 387
Canada	76	62	90	63	91	52	90	20
Japan	147	126	170	136	177	130	211	128
United Kingdom	92	100	94	105	101	109	107	126
France	95	105	98	104	102	108	125	129
West Germany	169	153	172	153	184	158	243	191
Italy	73	80	74	85	79	88	98	99
Other developed	287	301	299	308	311	322	372	439
Developing Countries	517	NA	535	NA	529	533	487	516
Africa	67	NA	67	NA	69	62	NA	60
Asia	159	180	180	194	178	202	190	205
Western Hemisphere	97	77	105	76	98	74	84	71
Middle East	136	134	120	122	106	119	NA	102
Total	$1,657	NA	$1,750	NA	$1,787	$1,862	$1,950	$2,035

p - Preliminary. NA - Not Available.

(a) Import values are cost, insurance, and freight (c.i.f.) except for Communist countries', which are free on board (f.o.b.).

(b) Exports include Department of Defense shipments.

Source: International Monetary Fund, "International Financial Statistics."

These figures show exports and imports of merchandise only.

U.S. TRADE WITH COMMUNIST COUNTRIES (a,c)

(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
	To Eastern Europe	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1966	$ 156.0	$ 41.7	Z	$ 129.1	$ 49.6	$ 0.1
1967	135.0	60.3	Z	136.1	41.2	0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	64.9
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979	2,066.2	3,603.6	1,716.5	998.8	873.2	592.3
1980	2,339.8	1,509.7	3,749.0	982.0	452.9	1,058.3
1981	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3
1982	1,012.8	2,583.7	2,912.1	839.4	227.6	2,283.7
1983	887.8	2,002.9	2,173.1	1,011.5	347.1	2,244.1
1984	903.9	3,283.9	3,004.3	1,599.4	600.1	3,064.8
1985	792.0	2,423.0	3,855.7	1,671.0	441.0	4,224.2
1986	737.0	1,248.0	3,106.0	1,596.0	605.0	5,241.0

z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.

(b) Does not include Yugoslavia.

(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce; "Business America."

BALANCE OF TRADE AND PAYMENTS
1983 to Date,
(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
1983(r)	-69.4	--40.8
1984(r)	-123.3	-101.5
1985E	-143.8	-109.9
Canada		
1983(r)	11.4	1.4
1984(r)	11.8	2.0
1985E	10.8	0
Japan		
1983(r)	20.6	20.8
1984(r)	33.5	35.0
1985E	39.6	47.5
United Kingdom		
1983(r)	-8.5	4.8
1984(r)	-11.1	1.2
1985E	-8.5	4.2
France		
1983(r)	-10.5	-4.4
1984(r)	-6.1	-.8
1985E	-6.6	.7
West Germany		
1983(r)	16.5	4.1
1984(r)	18.7	6.3
1985E	23.8	12.7
Italy		
1983(r)	-7.7	.8
1984(r)	-10.9	-3.0
1985E	-15.8	-7.2

r - Revised. E - Estimate.

(a) Balance of payments basis (exports f.o.b. less imports c.i.f.).
(b) Net exports of goods end services and unilateral transfers (OECD basis).
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.
(d) Data not published in 1986.

Source: "Economic Report of the President," February 1986.

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS IN MANUFACTURING
For Selected Years (r)
(U.S. Dollars)

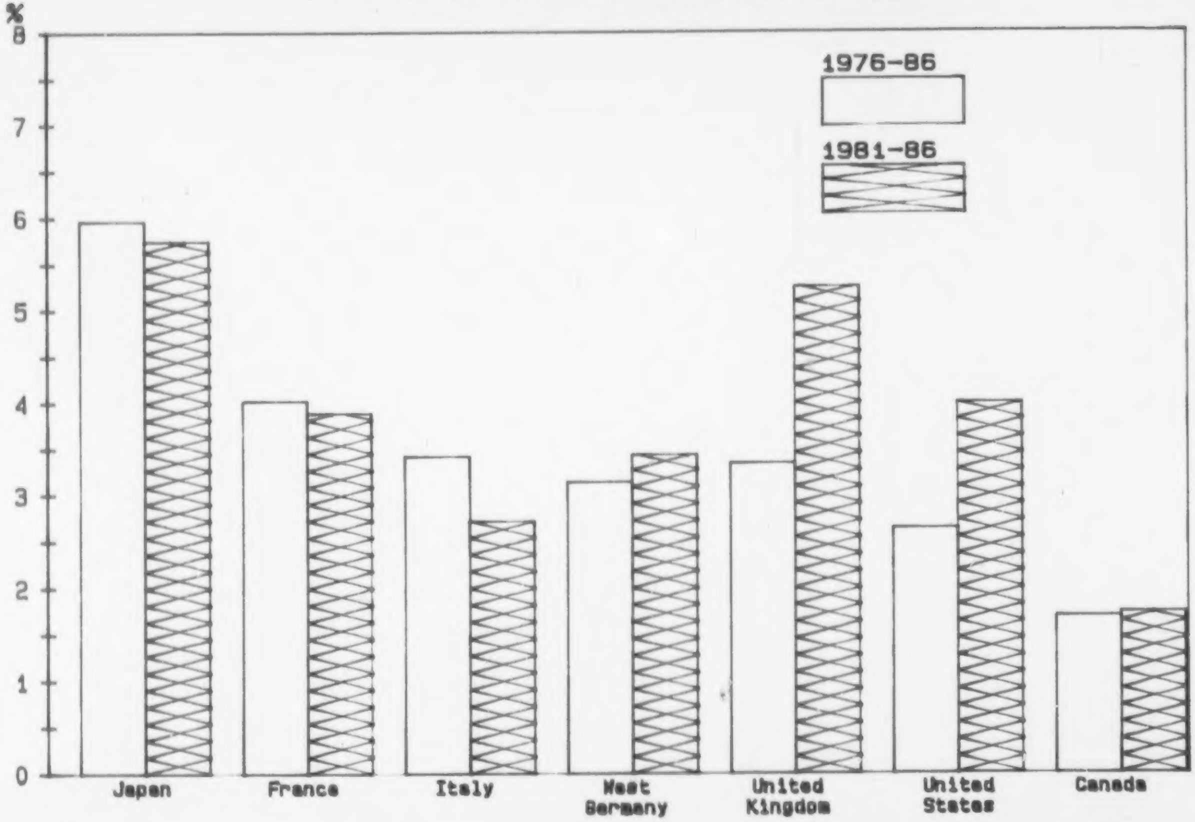
	1970	1980	1983	1984	1985	1986	Percent Increase 1980–1986
United States	$4.20	$ 9.80	$11.97	$12.40	$12.82	$13.09	34%
Canada	3.46	8.48	10.98	11.09	10.89	10.96	29
United Kingdom	1.46	7.38	6.32	5.88	6.14	7.46	1
France	1.74	9.12	7.92	7.48	7.71	10.45	14
West Germany	2.32	12.33	10.23	9.44	9.60	13.44	9
Italy	1.75	8.00	7.79	7.38	7.65	10.27	28
Sweden	2.96	12.51	8.89	9.17	9.66	12.23	-2
Japan	.99	5.61	6.13	6.35	6.45	9.50	69

r - Revised.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

For international comparisons of compensation in the machine tool industry, see Chapter 7.

Productivity
Average Annual Increase in Output
per Man-Hour in Manufacturing



PRODUCTIVITY IN MANUFACTURING (r)
Selected Countries, 1968 to Date
Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1968	62.9	55.8	35.9	48.9	33.4	42.0	45.0
1969	66.5	57.2	37.0	47.0	34.9	44.3	47.9
1970	71.0	64.5	39.1	46.8	42.9	50.6	54.2
1971	71.4	67.1	44.0	50.4	48.5	57.5	61.0
1972	72.1	70.0	52.9	57.1	55.1	64.5	68.2
1973	73.7	71.0	65.6	70.4	70.4	73.1	70.7
1974	84.1	81.8	76.8	74.5	79.1	77.6	79.5
1975	91.7	93.1	86.7	99.5	88.7	104.3	103.4
1976	94.9	102.7	86.9	96.3	87.3	90.5	92.9
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	106.6	99.3	126.8	117.3	121.0	115.6	126.1
1979	117.0	105.4	121.3	135.5	135.9	129.5	164.9
1980	130.6	121.5	116.8	154.1	147.9	141.4	220.5
1981	140.1	130.0	123.8	133.2	124.9	126.3	208.8
1982	148.7	143.4	108.8	122.4	119.7	125.4	187.2
1983	145.0	143.1	111.5	113.7	113.3	126.8	160.8
1984	144.2	139.9	107.2	103.8	102.7	114.7	144.3
1985	145.1	135.2	104.3	103.9	99.6	114.8	144.8
1986	144.3	137.2	148.7	138.0	139.2	151.4	171.9
Hourly Compensation (a)							
1968	50.2	40.5	17.8	30.4	21.7	27.1	34.9
1969	53.7	43.8	21.3	30.9	24.1	30.7	37.4
1970	57.4	48.8	25.3	32.6	30.5	36.8	43.2
1971	60.9	54.3	30.2	36.9	35.9	43.1	50.9
1972	64.2	59.4	39.8	44.3	43.4	52.3	60.7
1973	68.8	64.1	54.5	57.9	59.1	66.4	67.8
1974	76.2	75.0	66.4	63.4	69.1	73.9	77.4
1975	85.1	82.5	76.0	88.1	79.9	95.0	98.4
1976	92.1	97.3	81.9	91.5	84.2	89.5	92.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.2	100.3	137.0	123.9	124.8	119.1	128.0
1979	118.6	107.6	139.2	149.4	147.0	143.1	168.8
1980	132.4	119.3	143.2	172.6	160.7	165.3	224.3
1981	145.2	133.9	157.6	155.0	138.6	152.8	223.3
1982	157.5	144.0	146.9	151.1	134.8	154.8	212.7
1983	162.4	153.0	158.6	146.4	134.9	160.6	197.8
1984	168.2	154.2	163.5	138.9	126.9	154.5	186.9
1985	176.7	152.4	170.7	143.7	128.4	157.0	194.3
1986	181.9	154.7	250.2	194.5	182.9	209.5	237.5
Output Per Man Hour (Productivity)							
1968	79.8	72.7	49.8	62.3	64.9	64.5	76.2
1969	80.8	76.6	57.5	65.8	69.1	69.4	78.0
1970	80.8	75.6	64.8	69.6	71.2	72.7	79.7
1971	85.3	80.9	68.6	73.3	74.0	74.9	83.5
1972	89.0	84.9	75.3	77.7	78.9	81.1	89.1
1973	93.4	90.3	83.1	82.2	84.0	90.9	95.6
1974	90.6	91.7	86.5	85.2	87.4	95.3	97.4
1975	92.9	88.6	87.7	88.5	90.1	91.1	95.2
1976	97.1	94.8	94.3	95.0	96.5	98.9	99.5
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	101.5	101.1	108.0	105.7	103.1	103.0	101.5
1979	101.4	102.0	114.8	110.3	108.2	110.5	102.4
1980	101.4	98.2	122.7	112.0	108.6	116.9	101.7
1981	103.6	102.9	127.2	116.4	111.0	121.0	107.0
1982	105.9	100.4	135.0	123.5	112.6	123.4	113.6
1983	112.0	106.9	142.3	128.8	119.1	126.6	123.0
1984	116.6	110.2	152.5	133.8	123.5	134.7	129.5
1985	121.7	112.7	163.7	138.3	128.9	136.8	134.2
1986	126.0	112.1	168.2	140.9	131.4	138.4	138.2

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

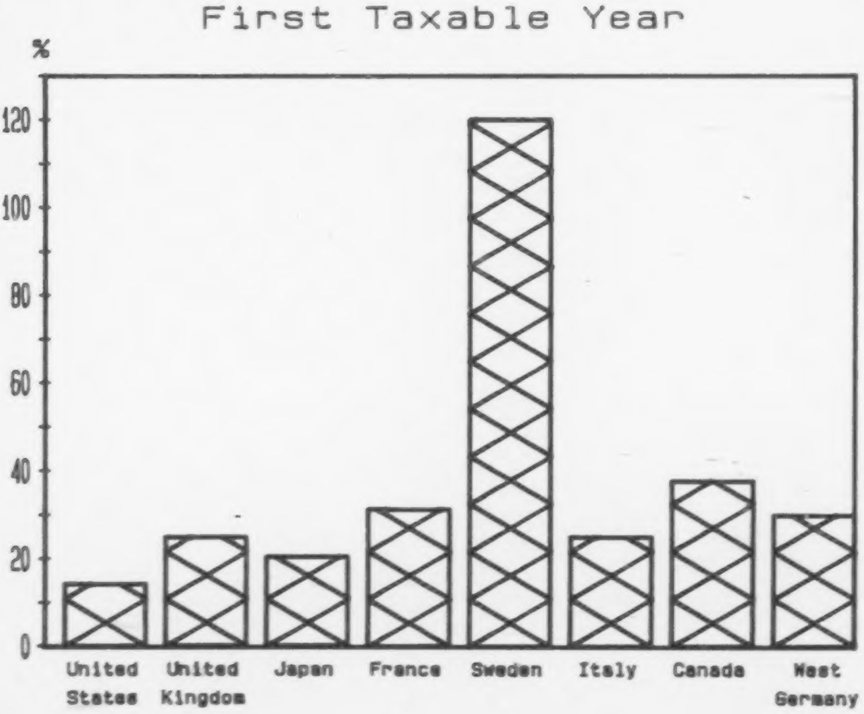
COST RECOVERY ALLOWABLE FOR TAX PURPOSES
ON MACHINERY AND EQUIPMENT, 1986
(Percent of Original Cost)

Country	Recovery Period (Years)	First Year	Third Year	Seventh Year
United States	7	14.3%	56.3%	95.5%
United Kingdom	11	25.0	57.0	86.7
Japan	10	20.6	50.0	80.1
France	8	31.3	67.4	94.9
Sweden	1	120.0	120.0	120.0
Italy	6	25.0	75.0	100.0
Belgium	7	33.0	61.8	102.0
Canada	3	37.7	107.4	107.4
Netherlands	8	44.4	69.4	119.4
West Germany	10	30.0	65.7	91.7
Australia	5	20.0	60.0	100.0

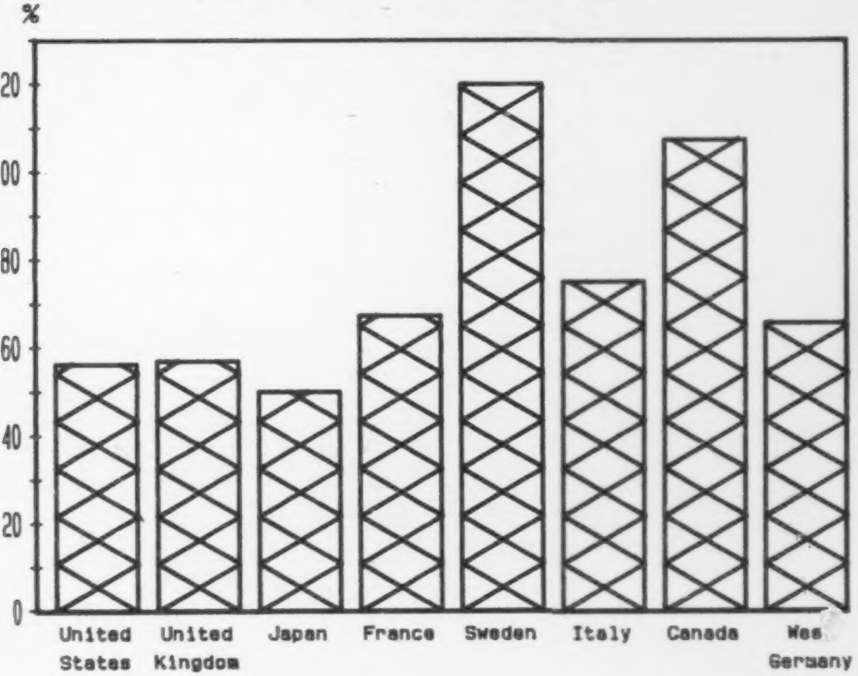
Note: These capital cost recovery allowances are based on current statutory or other published provisions of law. As such they do not reflect the informal or ad hoc arrangements that are frequently available in foreign countries to increase the rate of cost recovery actually allowed to industrial producers.

Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1986.

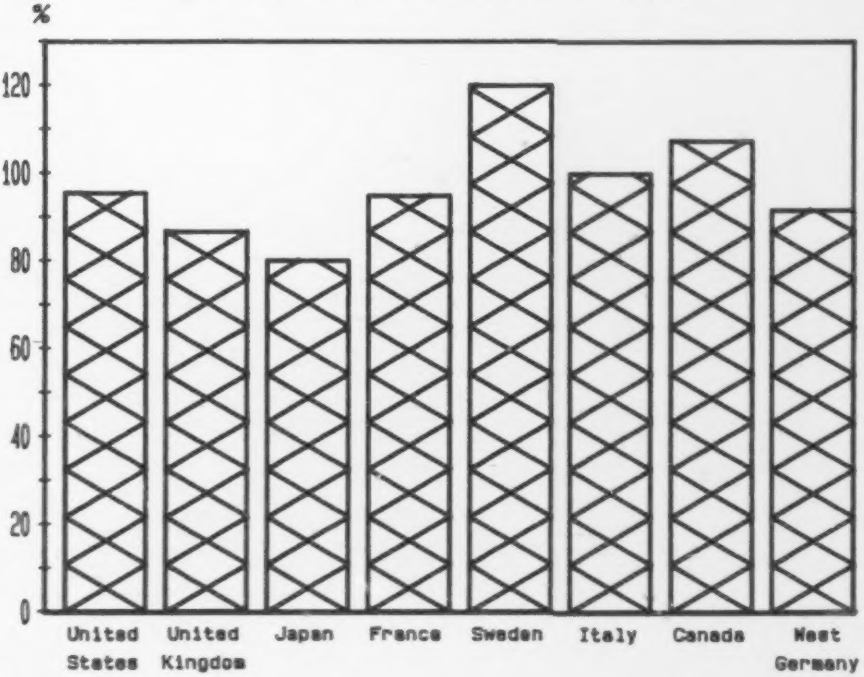
Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery can exceed 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country on a "typical" piece of capital equipment. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.



Third Taxable Year



Seventh Taxable Year



FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1985

Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (c)	Other (d)
Belgium	47.2%	10.7%	15.7%	3.0%	16.1%	1.7%
Canada	34.7	8.9	4.6	2.9	12.3	6.0
Denmark	49.9	16.4	2.0	2.4	25.0	4.1
France	44.5	12.8	19.4	1.9	5.7	4.7
Italy	41.2	9.7	14.3	3.8	11.0	2.4
Japan	28.2	3.4	8.5	5.9	7.0	3.4
Luxembourg	41.7	9.7	10.6	7.6	11.0	2.8
Netherlands	45.1	10.6	19.8	3.2	8.8	2.7
Sweden	51.8	13.1	12.9	1.8	20.0	4.0
Switzerland	30.2	5.3	9.7	1.8	10.5	2.9
Turkey	17.1	7.5	0.8	2.0	5.8	1.0
United Kingdom	43.2	12.9	7.6	5.6	11.2	5.9
United States	28.4	4.4	8.3	2.0	10.1	3.6
West Germany	37.6	9.2	13.8	2.3	10.8	1.5

(a) Includes general sales, value added, and specific excise taxes.
(b) Includes contributions of employers, employees, and self-employed.
(c) Includes income taxes on individual and unincorporated enterprise.
(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries," (Annual).

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1985

Selected Countries

Country	Total (a)	Employees	Employers	Self-Employed and Other
Belgium	15.7%	6.1%	8.3%	1.3%
Canada	4.6	1.6	2.9	0.1
Denmark	2.0	1.0	1.0	0.0
France	19.4	5.4	12.6	1.4
Italy	14.3	2.8	10.2	1.3
Japan	8.5	3.0	4.3	1.1
Luxembourg	10.6	4.3	5.7	0.6
Netherlands	19.8	8.6	7.9	3.4
Sweden	12.9	0.0	12.3	0.6
Switzerland	9.7	3.1	3.0	0.6
Turkey	0.8	0.2	0.6	0.0
United Kingdom	7.6	3.5	3.8	0.2
United States	8.3	3.2	4.9	0.3
West Germany	13.8	6.0	7.1	0.7

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund, workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries," (Annual).

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products". For the metal cutting industry this specialization ratio was 91% for 1982. This means that 91% of the products shipped by this industry were metal cutting machine tools and 9% were products other than metalcutting machine tools. For metal forming, the corresponding figures are 89% and 11%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio". In 1982, the coverage ratio in metal cutting was 93%, in metal forming 87%. This means that the metal cutting industry produced 93% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The fifth, sixth, and seventh digits are used to define product classes (fifth) and individual products (sixth and seventh). For example:

Industries	Major Group 35:	Machinery, Except Electrical
	Group 354:	Metalworking Machinery, and Equipment
	Industry 3541:	Machine Tools, Metal Cutting Types
Products	Product Class 35413:	Gear Cutting Machines
	Product 3541371:	Gear Tooth Finishing Machines

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry. If all of the machine tool industry were combined into one firm, its sales would rank 142nd on the 1986 "Fortune 500" listing of America's largest manufacturing companies.

While the most recent Census of Manufactures (1982) reports almost 1,400 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1982 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York, and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufactures (which takes place every five years) and the Annual Survey of Manufactures. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Much of the data published for smaller firms is actually not the product of either the Census or the Annual Surveys. Instead, most of the data for firms with fewer than twenty employees is estimated from administrative records on payroll and sales supplied to the Census Bureau by other government agencies. It is often the case that over ninety percent of the data on small firms is the product of these administrative record based estimates.

A second problem with the Census is that it is published with a considerable time lag. Because 1982 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1985 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufactures is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)

General Statistics, 1958 to Date

Year	Establishments		Employees (Number)	Value Added by Manufacturer	Cost of Materials	Value of Shipments
	Total	With 20 or More Employees		(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	936.8	513.7	1,430.3
1963	1,167	415	83,136	980.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	678.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	981.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.8	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972	1,277	437	76,600	1,319.4	821.6	2,114.4
1973	NA	NA	86,900	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,000	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977	1,343	469	83,100	2,588.0	1,491.7	3,943.3
1978	NA	NA	89,500	3,108.3	1,994.1	4,977.8
1979	NA	NA	96,100	3,837.8	2,423.9	6,052.5
1980	NA	NA	99,700	4,391.3	2,744.6	6,980.7
1981	NA	NA	98,300	4,716.4	2,850.0	7,481.0
1982	1,392	455	77,800	3,294.0	2,172.9	5,840.2
1983	NA	NA	58,300	2,242.3	1,554.9	4,023.2
1984	NA	NA	58,500	2,595.9	1,904.9	4,520.3
1985	NA	NA	60,500	2,933.2	2,070.3	4,789.3

NA - Not available.

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1966 to Date
Metal Cutting and Metal Forming

Year	Establishment: Total	Establishment: With 20 or More Employees	Employees (Number)	Value Added by Manufacturer (Millions of Dollars)	Cost of Materials (Millions of Dollars)	Value of Shipments (Millions of Dollars)
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1966	NA	NA	79,767	$1,234.2	$ 669.4	$1,826.1
1967	903	338	87,200	1,391.3	766.9	2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977	917	306	59,400	1,866.1	1,047.7	2,812.7
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979	NA	NA	69,100	2,833.8	1,736.9	4,389.0
1980	NA	NA	72,800	3,349.2	2,026.1	5,227.6
1981	NA	NA	74,300	3,739.9	2,187.3	5,865.3
1982	940	293	58,300	2,516.2	1,598.3	4,411.5
1983	NA	NA	43,000	1,612.7	1,100.0	2,880.9
1984	NA	NA	42,400	1,820.0	1,369.5	3,211.6
1985	NA	NA	42,800	2,000.0	1,471.6	3,377.0
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1966	NA	NA	28,407	$ 432.1	$ 311.9	$ 727.7
1967	350	168	29,200	437.2	295.4	714.0
1968	NA	NA	27,900	270.0	718.2	453.3
1969	NA	NA	28,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972	383	162	24,100	417.7	285.3	696.3
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,366.0
1979	NA	NA	27,000	1,004.0	687.0	1,663.5
1980	NA	NA	26,900	1,042.1	718.5	1,753.1
1981	NA	NA	24,000	976.5	662.7	1,615.7
1982	452	162	19,500	777.8	574.6	1,428.7
1983	NA	NA	15,300	629.6	454.9	1,142.3
1984	NA	NA	16,100	775.9	535.4	1,308.7
1985	NA	NA	17,700	933.2	598.7	1,412.8

NA - Not Available.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

LOCATION OF THE MACHINE TOOL INDUSTRY (c)
Establishments, Employees, Value Added, Shipments, By Region
For Selected Years, 1963 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. TOTAL					
1963	1,167	415	83,136	$ 980	$1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
1982	1,392	455	77,600	3,332	5,869
NEW ENGLAND					
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	56(a)	D
1982(d)	166	53	14,590E	D	D
MIDDLE ATLANTIC					
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
1982(d)	178	53	12,100E	280(b)	424(b)
EAST NORTH CENTRAL					
1963	545	239	49,415	592	926
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
1982(d)	565	228	39,200E	D	D
WEST NORTH CENTRAL					
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
1982(d)	104	37	6,810E	D	D
SOUTH					
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
1982(d)	71	22	1,630E	D	D
WEST					
1963	130	28	3,016	35	55
1967	180	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)
1982(d)	165	32	2,910E	57(b)	100(b)

D - Withheld to avoid disclosure. E - Estimate.

(a) Includes metal forming data only, metal cutting data withheld to avoid disclosure.

(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.

(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(d) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)

General Statistics by Region
For Selected Years, 1963 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. TOTAL					
1963	801	269	61,058	$ 699	$1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	919	307	59,500	1,871	2,819
1982	940	293	58,100	2,555	4,440
NEW ENGLAND					
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
1982(b)	129	42	13,680E	D	D
MIDDLE ATLANTIC					
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
1982(b)	103	30	7,400	280	424
EAST NORTH CENTRAL					
1963	387	161	36,845E	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
1982(b)	397	156	28,300E	D	D
WEST NORTH CENTRAL					
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
1982(b)	83	28	5,710E	D	D
SOUTH					
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
1982(b)	63	17	1,410E	D	D
WEST					
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96
1982(b)	111	14	1,600	57	100

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
For Selected Years, 1963 to 1982

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. Total					
1963	366	146	22,078	$ 281	$ 441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
1982	452	162	19,500	778	1,429
NEW ENGLAND					
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	56	D
1982(b)	37	11	910E	D	D
MIDDLE ATLANTIC					
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
1982(b)	75	23	4,700E	D	D
EAST NORTH CENTRAL					
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
1982(b)	168	72	10,900E	D	D
WEST NORTH CENTRAL					
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
1982(b)	21	9	1,100E	D	D
SOUTH					
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
1982(b)	8	5	220E	D	D
WEST					
1963	40	14	1,772	20	31
1967	51	19	1,900	29	43
1972	47	15	2,000	39	64
1977	58	22	1,300E	D	D
1982(b)	54	18	1,300E	D	D

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Region
1977 to 1982

	Establisnments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,200	358	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	180
STATE			1982(d)		
California	93	12	1,400	$ 50	$ 88
Connecticut	61	17	5,100	180	326
Florida	20	2	200	5	9
Illinois	90	30	5,400	208	358
Indiana	22	4	1,300	36	83
Iowa	4	2	(b)	D	D
Kansas	7	2	(b)	D	D
Kentucky	7	4	(b)	D	D
Maine	6	2	(b)	D	D
Massachusetts	35	11	2,600	114	176
Michigan	203	83	8,900	491	1,056
Minnesota	24	6	1,200	49	73
Missouri	7	1	200	3	8
New Hampshire	5	3	(c)	D	D
New Jersey	27	4	400	17	28
New York	42	14	4,900	176	275
North Carolina	8	4	200	8	22
Ohio	75	35	12,300	547	934
Pennsylvania	34	12	2,100	86	121
Rhode Island	16	5	(c)	D	D
South Carolina	5	2	(a)	D	D
South Dakota	3	2	(a)	D	D
Tennessee	3	1	(a)	D	D
Texas	22	6	(b)	D	D
Vermont	6	4	2,600	91	153
Virginia	5	2	(b)	D	D
Washington	18	2	200	7	12
Wisconsin	38	15	3,400	255	375

D – Withheld to avoid disclosure.

(a) 150 – 249 Employees.
(b) 250 – 499 Employees.
(c) 1,000 – 2,499 Employees.
(d) Data includes only states with 150 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82 – 1 – 35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY

General Statistics by Region

1977 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New York	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Pennsylvania	19	7	900	37	59
Texas	10	4	200	4	6
STATE			1982(d)		
California	42	13	1,000	$ 38	$ 79
Colorado	6	3	(a)	D	D
Connecticut	24	9	800	28	48
Illinois	56	25	4,400	232	397
Indiana	10	7	(b)	D	D
Kansas	5	3	300	10	19
Massachusetts	13	2	(a)	D	D
Michigan	55	22	1,600	67	117
Minnesota	5	2	(b)	D	D
Missouri	11	4	300	9	15
New Jersey	20	4	(b)	D	D
New York	31	9	1,700	49	91
North Carolina	4	3	(a)	D	D
Ohio	47	18	4,400	173	329
Pennsylvania	24	10	(c)	D	D
Virginia	4	2	(a)	D	D
Washington	6	2	200	8	12

D – Withheld to avoid disclosure.

(a) 150 – 249 Employees.
(b) 250 – 499 Employees.
(c) 1,000 – 2,499 Employees.
(d) Machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82 - 1 - 35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	1,146	1,209	1,232	1,285	1,290
Number of Establishments	1,167	1,253	1,277	1,345	1,392
Number of Employees	83,136	116,400	76,600	83,100	77,600(e)
1 to 4 Employees					
Establishments	375	336	380	434	433
Employees	714	500	800	800	900
5 to 9 Employees					
Establishments	191	189	212	262	279
Employees	1,295	1,300	1,500	1,700	1,900
10 to 19 Employees					
Establishments	186	222	248	178	225
Employees	2,612	3,100	3,400	2,400	3,000
20 to 49 Employees					
Establishments	182	218	194	219	202
Employees	5,643	6,500	6,000	6,700	6,200
50 to 99 Employees					
Establishments	96	111	89	98	110
Employees	6,455	7,700	6,200	6,700	7,600
100 to 249 Employees					
Establishments	67	79	83	75	75
Employees	10,620	12,700	12,500	11,500	11,900
250 to 499 Employees					
Establishments	31	43	37	41	29
Employees	11,249	15,100	12,600	14,800	9,700
500 to 999 Employees					
Establishments	22	30	24	27	31
Employees	15,583	21,400	17,600	21,700(a)	22,100(a)
1000 to 2499 Employees					
Establishments	22	8	8	7	14
Employees	19,236	35,500	16,200(b)	16,600(b,d)	14,200(b,d)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(c)	(c)	(c)
Covered by Administrative Records (f)					
Establishments	NA	330	355	673	740
Employees	NA	700	900	3,200	3,800

NA – Not Available.

(a) Also includes data for the "1000 to 2499 Employees" (metal forming only) category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000 – 2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting only) category.
(e) Due to estimating procedures by the Census department, individual items may not add to total.
(f) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82 – 1 – 35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	784	865	857	874	860
Number of Establishments	801	903	894	919	940
Number of Employees	61,058	87,200	52,500	59,400	58,100
1 to 4 Employees					
Establishments	276	256	281	315	295
Employees	529	400	600	600	600
5 to 9 Employees					
Establishments	127	142	158	184	202
Employees	840	1,000	1,100	1,200	1,400
10 to 19 Employees					
Establishments	129	167	180	112	150
Employees	1,803	2,300	2,500	1,500	2,000
20 to 49 Employees					
Establishments	118	145	126	144	122
Employees	3,607	4,300	3,900	4,400	3,800
50 to 99 Employees					
Establishments	56	74	55	67	73
Employees	3,727	5,200	3,800	4,600	4,900
100 to 249 Employees					
Establishments	44	49	47	40	45
Employees	6,912	8,100	7,000	6,300	7,000
250 to 499 Employees					
Establishments	22	30	24	28	22
Employees	7,713	10,600	8,400	10,300	7,500
500 to 999 Employees					
Establishments	15	20	14	19	24
Employees	10,664	13,900	9,200	13,800	16,700
1000 to 2499 Employees					
Establishments	11	17	7	7	6
Employees	15,534	28,900	16,200(a)	16,600(a)	14,200(a)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(b)	(b)	(b)
Covered by Administrative Records (c)					
Establishments	NA	245	265	455	545
Employees	NA	500	700	1,800	2,900

NA - Not Available.

(a) Also includes data for the "2500 Employees or More" category.
(b) The number of employees is included in the "1000-2499 Employees" category.
(c) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	362	344	375	411	430
Number of Establishments	366	350	383	426	452
Number of Employees	22,078	29,200	24,100	23,700	19,500
1 to 4 Employees					
Establishments	99	80	99	119	138
Employees	185	100	200	200	300
5 to 9 Employees					
Establishments	64	47	54	78	77
Employees	455	300	400	500	500
10 to 19 Employees					
Establishments	57	55	68	66	75
Employees	809	800	900	900	1,000
20 to 49 Employees					
Establishments	64	73	68	75	80
Employees	2,036	2,200	2,100	2,300	2,400
50 to 99 Employees					
Establishments	40	37	34	31	37
Employees	2,728	2,500	2,400	2,100	2,700
100 to 249 Employees					
Establishments	23	30	36	35	30
Employees	3,708	4,600	5,500	5,200	4,900
250 to 499 Employees					
Establishments	9	13	13	13	7
Employees	3,536	4,500	4,200	4,500	2,200
500 to 999 Employees					
Establishments	7	10	10	8	7
Employees	4,919	7,500	8,400(a)	7,900(a)	5,400(a)
1000 to 2499 Employees					
Establishments	3	5	1	1	1
Employees	3,702	6,600	(c)	(c)	(c)
2500 Employees or More					
Establishments	—	—	—	—	—
Employees	—	—	—	—	—
Covered by Administrative Records (d)					
Establishments	NA	85	90	218	195
Employees	NA	200	200	1,400	900

NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Due to estimating procedures by the Census department, individual items may not add to total.
(c) The number of employees is included in the "500-999 Employees" category.
(d) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY
End of Year, Selected Years, 1973 to Date
(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1973	$ 885.7	$ 591.9	$293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979	1,689.2	1,242.2	447.0
1980	1,874.6	1,419.4	455.2
1981	2,359.1	1,764.9	594.2
1982	1,943.1	1,431.6	511.5
1983	1,642.9	1,219.4	423.5
1984	1,690.6	1,237.4	453.2
Finished Products			
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979	312.1	222.3	89.8
1980	354.1	253.5	100.6
1981	507.1	343.6	163.5
1982	501.0	355.6	145.4
1983	441.5	310.2	131.3
1984	404.0	282.2	121.8
Work in Process			
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979	1,042.8	812.5	230.3
1980	1,220.3	989.4	230.9
1981	1,413.2	1,117.4	295.8
1982	1,047.1	809.5	237.6
1983	863.8	669.7	194.1
1984	928.1	705.5	222.6
Materials, Supplies, Fuel, Etc.			
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979	334.3	207.4	126.9
1980	300.0	176.4	123.6
1981	438.7	303.8	134.9
1982	395.0	266.5	128.5
1983	337.3	239.5	97.8
1984	358.5	249.7	108.8

* Beginning in 1983, a uniform reporting method was introduced based on cost or market valuations of inventories. This change replaces the numerous accounting methodologies accepted in the past.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES

Selected Years, 1967 to 1982

(Values in Millions of Dollars)

Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1967	$2,127.2	$1,715.7	$269.7	$141.8	86%
1972	1,418.1	1,135.5	188.9	93.7	86
1977	2,812.7	2,353.9	337.0	121.8	87
1982	4,440.2	3,877.2	369.5	193.6	91
Metal Forming Industry (3542)	**TOTAL SHIPMENTS**	**Metal Forming Machine Tools**	**Secondary Products**	**Miscellaneous Receipts**	**% Primary Product Specialization**
1967	$ 714.0	$ 568.4	$ 99.5	$ 46.1	85%
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90
1982	1,428.7	1,210.5	143.6	74.6	89

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982; Industry Series: Metalworking Machinery and Equipment MC82-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED

By the Machine Tool Industry, Selected Years

Quantity Used

Material	Unit of Measure	Metal Cutting Industry			Metal Forming Industry		
		1972	1977	1982	1972	1977	1982
MILL SHAPES							
Carbon Steel	Short Ton	85,900(i)	NA	NA	139,100(j)	113,400(a)	52,500(q)
Stainless Steel	Short Ton	900	NA	NA	500	100(m)	NA
Other Alloy Steel	Short Ton	24,500	20,000(o)	NA	9,600	12,000(n)	NA
Copper and Alloy	000 Lbs.	600(h,k)	3,800(d,h)	NA	300(k)	800(k)	NA
Aluminum and Alloy	000 Lbs.	1,400(b)	NA	NA	NA	1,100	NA
Iron and Steel Scrap	Short Ton	20,100	6,500	NA	D	NA	D
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	69,900	77,900(p)	7,300(r)	36,500	NA	D
Steel	Short Ton	NA	NA	D	11,100	12,400(p)	D
Aluminum and Alloy	000 Lbs.	NA	NA	D	700	2,600(p)	0
Copper and Alloy	000 Lbs.	1,100	1,700(p)	0	2,600	NA	0
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	4,700	5,900(p)	NA	7,500	8,200(p)	NA
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	96,300(c)	1,900(l,p)	D	900(1)	1,900(1,p)	0
Integral	Number	NA	NA	900(r)	NA	NA	D

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes structural shapes and all other carbon steel.
(b) Sheet and extrusion only.
(c) Excludes timing motors.
(d) Insulated wire and cable only.
(e) Excludes wire and wire products and sheet and strip.
(f) Excludes plate, sheet and strip and pipe and tube.
(g) Sheet and plate only.
(h) Bare wire only.
(i) Bars and bar shapes, sheet and strip, and plates only.
(j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
(k) Rod, bar, and mechanical wire and plate, sheet, and strip only.
(l) Timing motors only.
(m) Sheet and strip only.
(n) Excludes bars and bar shapes.
(o) Bars and bar shapes only.
(p) Purchased only.
(q) Plates only.
(r) Produced & Consumed only, no Purchases.

Source: U.S. Bureau of the Census. "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

SELECTED MATERIALS CONSUMED

By the Machine Tool Industry, Selected Years

(Millions of Dollars)

Material	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Cutting Industry 1982	Metal Forming Industry 1972	Metal Forming Industry 1977	Metal Forming Industry 1982
GRAND TOTAL	$ 454.3	$ 904.4	$1,380.0	$ 253.4	$ 395.7	$512.8
MILL SHAPES						
Carbon Steel	34.4	63.1	69.6	36.7	58.3	58.0
Stainless Steel	3.2	3.0	1.6	.6	.7	.8
Other Alloy Steel	15.5	23.2	18.8	7.0	12.1	7.5
Copper and Alloy	3.5	5.5	8.2	1.1(a)	2.4(c)	19.0
Aluminum and Alloy	1.4	1.7	3.4	0.8	2.7	.5(b)
Iron and Steel Scrap	.9	1.1	2.3	D	.7	.3
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	43.6	84.5	88.0	18.1	29.4	27.0
Steel	4.4	8.7	54.6	8.9	18.8	16.6
Aluminum and Alloy	4.1	6.0	3.0	.8	2.9	2.4
Copper and Alloy	1.2	2.5	1.2	2.9	1.5	2.9
IRON AND STEEL FORGINGS						
Iron and Steel Forgings	4.3	8.7	15.4	6.1	11.3	13.8
ELECTRICAL MOTORS AND GENERATORS						
Fractional	4.3	7.0	26.8	.6	2.7	5.1
Integral	16.3	26.3	35.1	6.6	12.6	6.7
BEARINGS						
Ball and Roller	13.2	18.6	25.9	3.7	7.6	9.5
ALL OTHER MATERIALS						
Components, Parts, Etc.	227.0	478.6	753.6	114.7	151.7	174.3
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	77.0	165.9	272.5	44.8	80.3	166.9

D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.
(b) Sheet, plate and foil only.
(c) Excludes plate, sheet and strip.

Source: U.S. Bureau of the Census "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

4

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix;" the share of the total comprised by the different major machine tool product categories.

One of the more notable of these changes is the increased share of "other machines" in metal cutting machine tool shipments. This category's share of output has risen from 15-20% in the late 1950's and early 1960's to more than twice that level in recent years. The reason for this dramatic rise is that this group includes station type machines and multi-function NC machines (machining centers). As such, its increased market share demonstrates parallel yet divergent trends ongoing in American metalworking.

Station type machines are highly specialized, dedicated machines, designed to produce one part in volumes of up to hundreds of thousands per year. They are the model of efficiency through the use of dedicated mass production. Machining centers, on the other hand, represent efficiency through flexibility. By virtue of their tool changing capability and their numerical control - in which a part-making program maintains the production process rather than manual control - these machines can be easily reprogrammed to produce a variety of parts.

These are only two examples of how machine tool technology and America's machine tool builders have responded to the changing metalworking needs of America's manufacturers.

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: most of the major categories of metal cutting machine tools (boring, drilling, gear cutting, presses, etc.), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind. Broad coverage is given to both metal cutting and metal forming machine tools in these reports.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1982 Census of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ-35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than either the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than the Census or Annual Survey.

NMTBA Estimate of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The figures received each month from respondents are expanded, based on "benchmark" totals derived from the MQ-35W reports, to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped, by 5- and 7-digit SIC categories, for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA "Industry Estimate."

The MQ-35W report also provides data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products, including those who produce machine tools for their own use but not for sale in the marketplace, and thus to cover all shipments.

SHIPMENTS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	133	900	803	97	343	307	36
1958	591	507	84	438	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	164	541	420	121	203	160	43
1961	751	522	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	205	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	158	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167
1982	3,604	3,198	406	2,895	2,599	296	710	600	110
1983	1,845	1,630	215	1,372	1,200	172	474	430	43
1984	2,286	2,093	193	1,607	1,484	123	679	609	71
1985	2,545	2,291	254	1,742	1,549	194	803	743	60
1986	2,579	2,306	272	1,890	1,685	206	688	621	67

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	$101	$ 315	$290	$ 25
1957	722	644	78	552	491	61	170	153	17
1958	427	350	77	299	247	52	128	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	29
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974	2,583	2,185	398	2,017	1,716	301	566	470	96
1975	1,277	1,064	213	916	781	135	361	284	77
1976	2,203	1,961	242	1,662	1,477	185	541	485	56
1977	2,995	2,709	286	2,202	1,981	221	793	729	64
1978	4,349	3,944	405	3,375	3,043	332	973	901	72
1979	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980	4,754	4,239	515	3,885	3,496	389	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100
1982	1,498	1,261	236	1,064	890	175	433	372	62
1983	1,696	1,558	138	1,152	1,069	82	545	489	56
1984	2,916	2,631	285	1,916	1,700	216	1,000	932	69
1985	2,528	2,262	266	1,853	1,652	201	675	610	65
1986	2,125	1,883	242	1,544	1,377	168	581	507	74

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1960 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1960	$ 790	$ 46	$ 744	$ 571	$ 36	$ 535	$ 219	$ 10	$ 209
1961	808	36	772	621	30	591	187	6	181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	1,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1,474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1,332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974	2,970	387	2,583	2,283	266	2,017	687	121	566
1975	1,651	374	1,277	1,198	282	916	453	92	361
1976	2,370	167	2,203	1,793	131	1,662	578	37	541
1977	3,153	158	2,995	2,329	127	2,202	824	31	793
1978	4,573	224	4,349	3,559	184	3,375	1,013	40	973
1979	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717
1982	1,934	437	1,498	1,467	402	1,064	468	34	433
1983	1,890	194	1,696	1,328	177	1,152	561	17	545
1984	3,044	128	2,916	2,005	90	1,916	1,038	38	1,000
1985	2,716	188	2,528	1,983	130	1,853	733	58	675
1986	2,322	197	2,125	1,675	131	1,544	647	66	581

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

UNFILLED ORDERS

Metal Cutting and Metal Forming Machine Tools, 1961 to Date

(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1961	$ 467	$ 394	$ 73	1974	$2,625	$2,025	$600
1962	463	354	109	1975	1,450	1,062	388
1963	628	475	153	1976	1,594	1,243	351
1964	1,043	669	374	1977	2,308	1,794	515
1965	1,311	899	412	1978	3,643	2,981	663
1966	1,701	1,307	394	1979	5,388	4,546	843
1967	1,317	1,089	228	1980	5,451	4,750	701
1968	1,064	810	412	1981	3,300	2,873	427
1969	1,195	812	394	1982	1,194	1,043	151
1970	706	471	228	1983	1,045	823	222
1971	569	408	162	1984	1,675	1,132	542
1972	963	702	621	1985	1,658	1,243	414
1973	2,074	1,454	621	1986	1,204	897	307

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	337	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282
1982	1,467	402	1,064	1,262	373	890	204	30	175
1983	1,328	177	1,152	1,236	167	1,069	92	10	82
1964	2,005	90	1,916	1,780	80	1,700	226	9	216
1985	1,983	130	1,853	1,769	117	1,652	213	13	201
1986	1,675	131	1,544	1,499	122	1,377	176	9	168

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

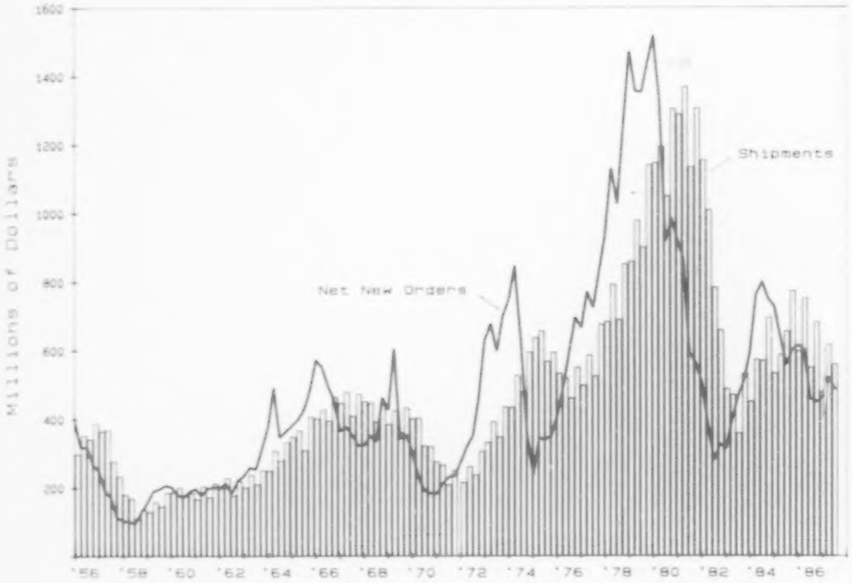
(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$ 340	$ 25	$ 315	$ 314	$ 24	$290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	278	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974	687	121	566	583	113	470	105	8	96
1975	453	92	361	364	81	284	89	12	77
1976	578	37	541	513	28	485	64	8	56
1977	824	31	793	757	29	729	67	2	64
1978	1,013	40	973	938	37	901	75	3	72
1979	1,190	64	1,126	1,048	57	991	142	7	136
1980	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100
1982	468	34	433	399	28	372	68	7	62
1983	561	17	545	503	14	489	58	2	56
1984	1,038	38	1,000	967	36	932	71	3	69
1985	733	58	675	664	54	610	69	4	65
1986	647	66	581	567	60	507	81	7	74

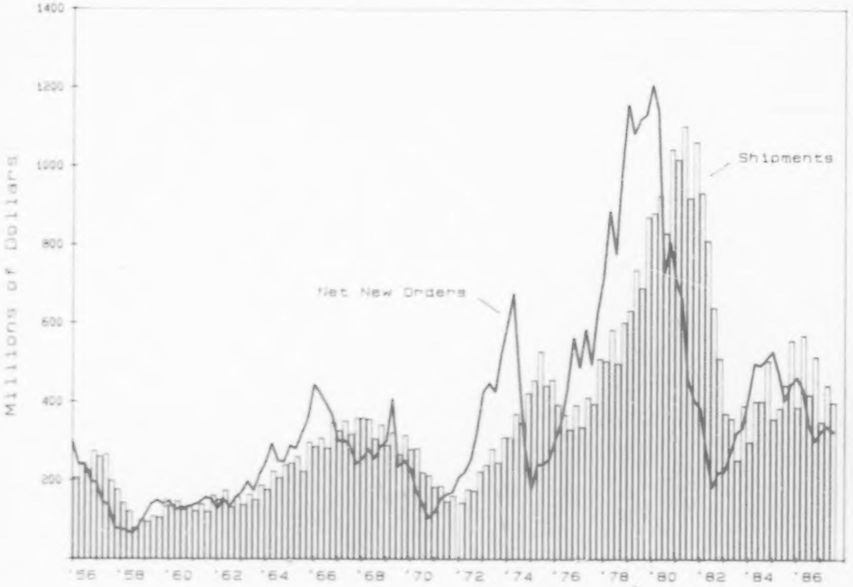
Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

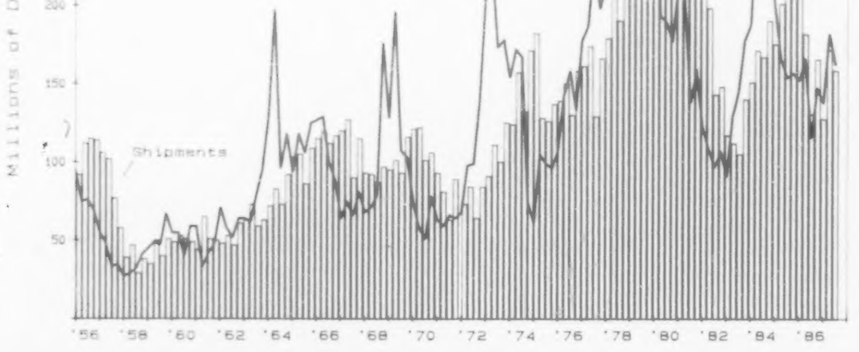
Total Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956:1 to 1987:3



Metal Cutting Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1987: 3



Metal Forming Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1987: 3



SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1956-1963

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 274,100	$ 23,750	$187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,600	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$1,270,300	$107,000	$858,200	$ 87,000	$412,100	$20,000
1957-1 qtr.	$ 331,900	$ 33,350	$232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$1,110,350	$132,350	$803,550	$ 96,600	$306,800	$35,750
1958-1 qtr.	$ 160,050	$ 19,900	$125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$381,100	$ 57,300	$126,050	$26,750
1959-1 qtr.	$ 108,200	$ 20,750	$ 79,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$389,850	$ 50,750	$148,450	$26,950
1960-1 qtr.	$ 159,550	$ 25,950	$117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$163,150	$420,750	$120,750	$160,100	$42,400
1961-1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$228,250	$366,550	$174,700	$156,100	$53,550
1962-1 qtr.	$ 140,250	$ 57,700	$106,100	$ 43,900	$ 34,150	$13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$215,200	$450,050	$162,800	$156,000	$52,400
1963-1 qtr.	$ 163,100	$ 36,850	$112,600	$ 24,650	$ 50,500	$12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	150,450	36,700	51,400	11,300
Total	$ 741,250	$154,500	$526,050	$112,400	$215,200	$42,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1964-1971
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1964-1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$10,150
2	259,800	46,700	183,550	39,850	76,250	6,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$204,600	$ 679,150	$165,500	$280,600	$39,100
1965-1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$1,248,800	$176,800	$ 885,850	$136,700	$362,950	$40,100
1966-1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$1,534,350	$150,850	$1,097,500	$124,250	$436,850	$26,600
1967-1 qtr.	$ 399,500	$ 41,050	$ 289,750	$ 35,900	$109,750	$10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$1,617,950	$188,000	$1,211,050	$142,150	$406,900	$45,850
1968-1 qtr.	$ 402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$1,562,750	$164,150	$1,238,300	$120,000	$324,450	$44,150
1969-1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$1,446,750	$150,800	$1,077,450	$115,000	$369,300	$35,800
1970-1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$110,450	$10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$1,238,950	$204,100	$ 827,350	$165,550	$411,600	$38,550
1971-1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209,950	38,800	136,800	23,450	73,150	15,350
Total	$ 839,800	$158,100	$ 554,200	$118,100	$285,600	$40,000

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1972-1979
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1972-1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58.000	5,850
4	271,750	34,700	198,300	24,150	73,450	10,550
Total	$ 894,350	$124,350	$ 627,150	$ 87,300	$267,200	$ 37,050
1973-1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$1,323.100	$177,900	$ 935,050	$138,700	$388,050	$ 39,200
1974-1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$1,763,150	$267,400	$1,241,350	$204,500	$521,800	$ 62,900
1975-1 qtr.	$ 526,550	$109,700	$ 375,400	$ 78,400	$151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$2,032,600	$419,100	$1,548,100	$330,550	$484,500	$ 88,550
1976-1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 58,500	$112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$1,743,350	$316,300	$1,269,850	$212,250	$473,500	$104,050
1977-1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$136,250	$ 24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$2,030,200	$250,550	$1,469,850	$180,950	$560,350	$ 69,600
1978-1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$161,250	$ 18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$2,688,600	$324,850	$1,960,100	$228,400	$728,500	$ 96,450
1979-1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$205,300	$ 19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$3,465,300	$411,250	$2,605,500	$324,550	$859,800	$ 86,700

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1980 to Date

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1980-1 qtr.	$1,030,450	$115,700	$ 794,650	$ 86,750	$235,800	$ 28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$4,084,250	$607,500	$3,206,000	$474,800	$878,250	$132,700
1981-1 qtr.	$1,077,400	$210,800	$ 862,250	$155,600	$215,150	$ 55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$4,376,650	$718,950	$3,552,450	$552,050	$824,200	$166,900
1982-1 qtr.	$1,041,550	$112,650	$ 861,300	$ 71,750	$180,250	$ 40,900
2	911,850	96,600	735,300	75,350	176,550	21,250
3	676,200	107,200	550,700	89,750	125,500	17,450
4	568,750	89,600	451,300	59,300	117,450	30,300
Total	$3,198,350	$406,050	$2,598,600	$296,150	$599,750	$109,900
1983-1 qtr.	$ 430,800	$ 56,650	$ 329,800	$ 40,800	$101,000	$ 15,850
2	411,350	58,300	308,200	49,300	103,150	9,000
3	314,150	42,900	220,150	32,200	94,000	10,700
4	473,750	57,150	341,450	49,600	132,300	7,550
Total	$1,630,050	$215,000	$1,199,600	$171,900	$430,450	$ 43,100
1984-1 qtr.	$ 408,950	$ 40,550	$ 273,000	$ 25,100	$135,950	$ 15,450
2	521,600	50,700	373,550	28,250	148,050	22,450
3	527,000	41,850	377,250	24,300	149,750	17,550
4	635,050	60,150	460,050	45,000	175,000	15,150
Total	$2,092,600	$193,250	$1,483,850	$122,650	$608,750	$ 70,600
1985-1 qtr.	$ 482,750	$ 48,950	$ 319,900	$ 37,150	$162,850	$ 11,800
2	548,350	37,700	357,550	27,450	190,800	10,250
3	596,400	58,250	407,100	35,950	189,300	22,300
4	663,950	108,850	463,950	93,200	200,000	15,650
Total	$2,291,450	$253,750	$1,548,500	$193,750	$742,950	$ 60,000
1986-1 qtr.	$ 529,800	$ 67,500	$ 331,750	$ 55,200	$198,050	$ 12,300
2	686,900	64,100	519,850	49,500	167,050	14,600
3	485,150	64,200	369,200	49,500	115,950	14,700
4	604,200	76,650	463,900	51,400	140.300	25,250
Total	$2,306,050	$272,450	$1,684,700	$205,600	$621,350	$ 66,850

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipment and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1956-1963

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 353,700	$ 39,050	$265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222,550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$1,172,250	$126,600	$882,200	$101,300	$290,050	$25,300
1957-1 qtr.	$ 221,300	$ 25,500	$168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$491,950	$ 61,200	$153,550	$17,050
1958-1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$247,950	$ 51,550	$103,350	$25,900
1959-1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45,150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$105,800	$470,950	$ 70,850	$173,500	$34,950
1960-1 qtr.	$ 158,500	$ 44,750	$112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$217,300	$375,000	$160,300	$152,650	$57,000
1961-1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$237,800	$401,150	$190,650	$135,600	$47,150
1962-1 qtr.	$ 156,600	$ 42,300	$102,200	$ 26,200	$ 54,400	$16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 562,050	$154,550	$468,850	$103,250	$193,200	$51,300
1963-1 qtr.	$ 196,150	$ 39,000	$140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$191,950	$606,850	$152,900	$262,800	$39,050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1964-1971

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1964-1 qtr.	$ 312,150	$ 64,000	$ 194,200	$ 52,900	$117,950	$11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$1,348,050	$230,850	$ 861,250	$177,900	$486,800	$52,950
1965-1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$1,532,950	$160,450	$1,122,650	$129,050	$410,300	$31,400
1966-1 qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$116,050	$11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$1,884,450	$191,200	$1,483,100	$146,800	$401,350	$44,400
1967-1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,800
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$1,272,800	$148,800	$1,024,650	$110,300	$248,150	$38,500
1968-1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$1,320,450	$153,650	$ 959,900	$119,450	$360,550	$34,200
1969-1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$116,550	$11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$1,517,000	$211,750	$1,032,650	$162,650	$484,350	$49,100
1970-1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$179,200	$ 506,750	$144,550	$226,600	$34,650
1971-1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128,800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$113,850	$ 524,100	$ 84,650	$223,200	$29,200

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1972-1979

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1972-1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$1,245,450	$166,550	$ 877,250	$131,700	$368,200	$ 34,850
1973-1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$188,000	$ 18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$2,267,600	$345,050	$1,550,400	$275,050	$717,200	$ 70,000
1974-1 qtr.	$ 644,500	$107,700	$ 509,750	$ 88,100	$134,750	$ 19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$2,185,250	$397,800	$1,715,650	$301,400	$469,600	$ 96,400
1975-1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$ 20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$1,064,050	$212,700	$ 780,500	$135,400	$283,550	$ 77,300
1976-1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$ 13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$1,961,450	$241,750	$1,476,600	$185,550	$484,850	$ 56,200
1977-1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$2,709,650	$285,700	$1,980,700	$221,350	$728,950	$ 64,350
1978-1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$3,944,100	$404,400	$3,043,150	$332,300	$900,950	$ 72,100
1979-1 qtr.	$1,322,800	$148,600	$1,031,550	$126,700	$291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$4,856,500	$764,950	$3,865,800	$629,300	$990,700	$135,650

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1980 to Date

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foriegn
1980-1 qtr.	$1,331,950	$185,500	$1,057,900	$149,900	$274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$4,239,550	$514,750	$3,495,500	$389,250	$744,050	$125,500
1981-1 qtr.	$ 809,950	$110,400	$ 615,250	$ 91,350	$194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	23,050
Total	$2,562,650	$382,200	$1,945,800	$282,300	$616,850	$ 99,900
1982-1 qtr.	$ 432,300	$ 74,500	$ 328,400	$ 56,450	$103,900	$ 18,050
2	303,050	79,600	216,450	58,300	86,600	21,300
3	237,300	42,650	154,000	29,450	83,300	13,200
4	288,700	39,650	190,750	30,650	97,950	9,000
Total	$1,261,350	$236,400	$ 889,600	$174,850	$371,750	$ 61,550
1983-1 qtr.	$ 285,550	$ 29,300	$ 205,850	$ 18,250	$ 79,700	$ 11,050
2	366,700	32,400	250,300	19,000	116,400	13,400
3	439,450	28,700	305,900	16,300	133,550	12,400
4	466,500	47,550	307,400	28,650	159,100	18,900
Total	$1,558,200	$137,950	$1,069,450	$ 82,200	$488,750	$ 55,750
1984-1 qtr	$ 551,900	$ 48,550	$ 376,100	$ 36,650	$175,800	$ 11,900
2	654,650	109,750	410,750	88,450	243,900	21,300
3	734,950	65,250	439,150	53,850	295,800	11,400
4	689,550	61,200	473,550	37,300	216,000	23,900
Total	$2,631,050	$284,750	$1,699,550	$216,250	$931,500	$ 68,500
1985-1 qtr.	$ 663,250	$ 65,000	$ 475,500	$ 53,000	$187,650	$ 12,000
2	582,450	58,950	430,150	45,550	152,300	13,400
3	465,350	93,100	338,800	65,950	126,550	27,150
4	551,100	48,900	407,700	36,450	143,400	12,450
Total	$2,262,150	$265,950	$1,652,150	$200,950	$610,000	$ 65,000
1986-1 qtr.	$ 570,000	$ 45,750	$ 431,450	$ 32,050	$138,550	$ 13,700
2	536,800	63,800	382,450	52,200	154,350	11,600
3	387,900	71,750	297,800	46,250	90,100	25,500
4	388,650	60,650	264,850	37,200	123,800	23,450
Total	$1,883,350	$241,950	$1,376,550	$167,700	$506,800	$ 74,250

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS

By Type of Machine, 1977 to Date

(Millions of Dollars)

	1977	1978	1979	1980	1981	1982	1983	1984
MACHINE TOOLS TOTAL	$3,675.2	$4,735.0	$5,762.3	$6,701.5	$7,206.1	$5,538.6	$3,664.1	$4,177.6
METAL CUTTING TOTAL	$2,560.5	$3,377.1	$4,127.5	$4,952.3	$5,554.0	$4,154.7	$2,544.9	$2,815.0
Boring Machines	93.5	133.0	169.9	200.0	227.0	198.7	103.2	102.7
Drilling Machine	108.9	(155.0)	167.1	188.8	155.0	67.3	36.2	40.1
Gear Cutting & Finishing Machines	67.1	111.5	104.6	124.7	132.5	87.3	40.3	41.6
Grinding & Polishing Machines (a)	288.3	359.5	464.5	553.8	623.3	515.3	331.6	378.3
Lathes	455.9	554.9	675.7	823.0	865.3	523.6	306.5	300.6
Milling Machines	167.8	204.8	259.3	(322.0)	390.4	264.5	145.4	184.6
Other Machine Tools (b)	713.6	994.8	1,279.3	1,620.8	1,838.3	1,437.4	709.7	802.7
Parts (c)	502.1	606.0	813.7	877.3	1,038.2	891.9	694.6	794.6
Not Specified by Kind	163.3	(s)	(193.3)	(241.8)	(284.0)	168.7	177.5	169.8
METAL FORMING TOTAL	1,114.7	1,357.9	1,634.8	1,749.2	1,652.1	1,383.9	1,119.2	1,362.6
Punching, Shearing, Bending & Forming	280.1	320.4	389.9	429.0	444.1	317.3	242.3	355.4
Presses (d)	282.6	369.1	449.5	498.5	422.7	369.2	176.5	247.7
Other (b,d)	171.7	220.3	264.4	238.9	221.4	217.0	168.9	178.4
Parts (c)	295.5	400.5	482.5	530.8	498.4	380.0	430.7	482.7
Not Specified by Kind	84.8	(s)	48.5	52.0	65.5	100.5	100.8	98.4

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines; for 1977 - 82 honing and lapping machines are included.

(b) Including those designed primarily for Home Workshops, Laboratories, etc.

(c) Data represents parts sold separately and rebuilt machine tools.

(d) 1977 - 78 Forging Presses are included in "Presses," 1979 to date Forging Presses are included in "Other."

(s) Withheld because estimate did not meet publication standards.

( ) Indicates standard errors exceeding 15%.

This table, includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

Sources: U.S. Bureau of the Census; "Census of Manufactures, Metal Working Machinery and Equipment" and "Annual Survey of Manufactures."

SHIPMENTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date (a)

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$ 648,368	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,962	764,453	57,503	737,051	113,479	27,402
1962	190,286	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,665	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73.517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	129,479E
1980	323.899	4,812,349	88,428E	4,674,068E	235,471E	138,281E
1981	301,313	5,111,253	87,981E	5,007,848E	213,332E	103,405E
1982	178,638	3,804,250	53,141E	3,738,397E	125,497E	65,853E
1983	150,837	2,144,849	43,199E	1,986,212E	107,638E	58,637E
1984(r)	162,438	2,426,382	49,255E	2,361,426E	113,183E	64,920E
1985(r)	148,348	2,717,814	51,309E	2,659,175E	97,039E	58,639E
1986(p)	141,253	2,779,907	47,144E	2,722,541E	94,109E	57,366E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date
(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22.075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,380	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,884
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,980E
1980	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981	234,647	4,046,940	66,076E	3,978,970E	168,571E	67,970E
1982	130,434	2,940,626	35,060E	2,899,429E	95,374E	41,197E
1983	100,764	1,564,204	27,088E	1,532,210E	73,676E	31,994E
1984(r)	105,740	1,688,296	31,481E	1,653,463E	74,259E	34,833E
1985(r)	94,884	1,888,275	32,507E	1,857,826E	62,377E	30,449E
1986(p)	91,049	1,999,389	29,114E	1,968,202E	61,935E	31,187E

p - Preliminary. r - Revised. NA - Not available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date (a)
(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981	66,666	1,064,313	21,905	1,028,878	44,761	35,435
1982	48,204	863,624	18,081	838,968	30,123	24,656
1983	50,073	580,645	16,111	554,002	33,962	26,643
1984(r)	56,698	758,086	17,774	707,999	38,924	30,087
1985(r)	53,464	829,539	18,802	801,349	34,662	28,190
1986(p)	50,204E	780,518E	18,030E	754,339E	32,174	26,179

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series, MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1955 to Date

(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1955	$ 665.8	$ 77.4	$ 53.8	$ 36.6	$123.9	$153.3	$ 89.6	$ 131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	66.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980	3,716.4	192.0	166.9	130.3	555.8	827.0	339.3	1,505.2
1981	4,046.9	231.0	140.0	133.1	615.4	816.8	436.6	1,674.2
1982	2,940.6	193.8	65.9	86.5	486.7	507.3	265.6	1,334.9
1983	1,564.2	95.8	41.1	35.8	280.8	320.9	146.5	643.4
1984(r)	1,688.3	96.1	37.2	42.4	335.6	307.6	179.9	669.5
1985(r)	1,888.3	85.1	38.2	51.8	415.0	318.7	180.6	798.9
1986(p)	1,999.4	82.3	41.5	57.3	422.0	261.7	161.2	973.3

p - Preliminary. r - Revised.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1955 to Date

(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1955	11.6%	8.1%	5.5%	18.6%	23.0%	13.5%	19.7%
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	6.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	18.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980	5.2	4.5	3.5	15.0	22.3	9.1	40.5
1981	5.7	3.5	3.3	15.2	20.2	10.8	41.4
1982	6.6	2.2	2.9	16.6	17.3	9.0	45.4
1983	6.1	2.6	2.3	18.0	20.5	9.4	41.1
1984(r)	5.7	2.2	2.5	19.9	18.2	10.7	40.8
1985(r)	4.5	2.0	2.7	22.0	16.9	9.6	42.3
1986(p)	4.1	2.1	2.9	21.1	13.1	8.1	48.7

p - Preliminary. r - Revised.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1955 to Date
(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1955	$ 295.4	$170.8	$15.6	$ 28.9	$ 35.8	$ 44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0	84.7	181.2	183.4	143.5
1980	1,096.0	440.8	73.8	204.2	214.9	162.3
1981	1,064.3	429.6	79.0	206.1	212.8	136.8
1982	863.6	344.8	79.0	142.2	166.5	131.1
1983	580.6	160.8	48.0	120.1	138.6	113.1
1984(r)	738.1	230.1	29.0	139.2	177.9	161.9
1985(r)	829.5	254.0	35.4	161.7	178.4	200.0
1986(p)	780.5E	290.2	17.2E	116.2	175.3	181.6

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1955 to Date

(Percentage of Dollar Value)

Year	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1955	57.8%	5.3%	9.8%	12.1%	15.0%
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3	8.2	17.6	17.9	14.0
1980	40.2	6.7	18.6	19.6	14.8
1981	40.4	7.4	19.4	20.0	12.9
1982	39.9	9.1	16.5	19.3	15.2
1983	27.7	8.3	20.7	23.9	19.5
1984(r)	31.2	3.9	18.9	24.1	21.9
1985(r)	30.6	4.3	19.5	21.5	24.1
1986(p)	37.2	2.2E	14.9	22.5	23.3

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
TOTAL						
	1970(a)	1,901	$ 209.0	1982(g)	6,066	$1,126.6
	1971(a)	1,238	153.2	1983(g)	4,781	677.1
	1972(a)	1,630	170.1	1984(r,g)	5,581	739.5
	1973(a)	2,865	272.1	1985(r,g)	5,343	819.3
	1974(a)	4,210	378.7	1986(p,g)	5,182	802.1
	1975(a)	4,136	504.7			
	1976(a)	3,856	501.0			
	1977(a)	4,482	496.7			
	1978(a)	5,688	649.2			
	1979(g)	7,925	1,014.6			
	1980(g)	9,984	1,371.7			
	1981(g)	8,945	1,467.3			
Boring Machines						
	1970	175	29.5	1982	231	110.7
	1971	92	18.4	1983	69	37.1
	1972	84	21.0	1984	119	45.1
	1973	128	26.8	1985(r)	89	35.4
	1974	146	33.7	1986(p)	124	48.7
	1975	153	39.4			
	1976	120	35.6			
	1977	101	33.0			
	1978	127	47.3			
	1979	186	69.6			
	1980	226	92.5			
	1981	293	120.2			
Drilling Machines (h)						
	1970	215	13.0	1982	0	0
	1971	138	11.3	1983	0	0
	1972	118	8.4	1984	0	0
	1973	326	19.0	1985	0	0
	1974	216	11.7	1986(p)	(b)	(b)
	1975	100	11.0			
	1976	197	13.2			
	1977	288	20.0			
	1978	321	22.0			
	1979	237	17.7			
	1980	384	33.4			
	1981	455	52.8			
Lathes						
	1970	507	55.3	1982	1,489	333.4
	1971	428	50.4	1983	1,202	224.6
	1972	570	67.1	1984	1,497	207.8
	1973(c)	1,031	95.2	1985	1,420	225.2
	1974	1,381	137.3	1986(p)	1,163	188.1
	1975	1,640	212.7			
	1976	1,321	205.9			
	1977	1,178	195.3			
	1978	1,464	237.2			
	1979	2,362	347.7			
	1980	2,739	481.2			
	1981	2,021	441.4			

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls Units	SHIPMENTS of Machines and Controls Value	Year	SHIPMENTS of Machines and Controls Units	SHIPMENTS of Machines and Controls Value
Milling Machines (d)						
	1970	150	$ 23.4	1982	1,061	$ 185.6
	1971	105	12.6	1983	1,091	108.9
	1972	229	15.8	1984	1,434	108.9
	1973	240	16.1	1985(r)	1,087	96.6
	1979	2,045	93.8	1986(p)	1,121	106.2
	1980	2,600	162.7			
	1981	1,763	190.6			
Machining Centers						
	1970	651	68.9	1982(i)	1,396	357.6
	1971	344	46.6	1983(i)	1,005	182.9
	1972	475	45.3	1984	1,237	213.2
	1973	1,162	115.1	1985(r)	1,077	214.7
	1974	1,692	163.1	1986(p)	904	204.1
	1975	1,460	196.8			
	1976	1,225	178.4			
	1977	1,201	175.0			
	1978	1,486	246.0			
	1979	1,953	356.5			
	1980	2,132	413.0			
	1981	2,081	482.7			
Grinding and Polishing Machines						
	1980	271	32.9	1984	546	65.9
	1981	645	46.7	1985(r)	724	122.4
	1982	590	49.6	1986(p)	831	146.5
	1983	494	42.7			
All Other Metal Cutting and Metal Forming Type Machine Tools						
	1970	203	19.0	1982(g)	1,299	89.6
	1971	131	13.9	1983(g)	920	80.9
	1972	154	12.6	1984(r,g)	751	98.6
	1973(a,e)	17	5.0	1985(g)	946	122.0
	1974(a,f)	775	32.8	1986(p,g)	1,039	108.6
	1975(a,f)	783	44.8			
	1976(a,f)	993	67.9			
	1977(a,f)	1,714	73.4			
	1978(a,f)	2,290	96.7			
	1979(g)	936	100.7			
	1980(g)	1,632	156.0			
	1981(g)	1,667	133.0			

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) "Drilling Machines" are included in the "All Other" category.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.
(h) The data for 1982 and 1983 should have been reported in "Machining Centers." It is possible that the data for 1970 through 1981 was misclassified and overstated.
(i) The data for 1982 and 1983 reflect the addition of misclassified data, originally reported in "Drilling Machines."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY

By Type of Control

Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
		Millions of Dollars			Millions of Dollars	
	Number of Machines	Machines & Controls	Controls Only	Number of Machines	Machines & Controls	Controls Only
TOTAL						
1964	1,517	$ 105.5	$ 29.2	987	$ 113.7	$ 26.4
1965	2,100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	28.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	6.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	782	211.4	41.4
1968	991	198.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	108.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	286	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS								
TOTAL	1,671	1,793	1,699	994	455	475	425	485
Horizontal Boring, Drilling & Milling Machines								
Table Type	97	102	115	77	29	28E	D	D
Floor Type	82	72	29					
Precision Boring Machines	868	771	661	564	370	400	372	432
Jig Boring Machines All Other Boring Machines	624	848	894	353	56(a)	47E(a)	D(a)	D(a)
VALUE (Millions of Dollars)								
TOTAL	$177.7	$192.0	$231.0	$193.8	$95.8	$96.1	$85.1	$82.3
Horizontal Boring, Drilling and Milling Machines								
Table Type	38.1	41.4	53.0	51.4	20.5	35.3E	D	D
Floor Type	21.4	23.8	15.5					
Precision Boring Machines	87.8	96.3	122.1	109.7	60.5	49.7	48.9	64.2
Jig Boring Machines All Other Boring Machines	30.1	30.5	40.4	32.7	14.8(a)	9.5E(a)	D(a)	D(a)

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Data withheld to avoid disclosure.

(a) There were no machines valued less than $2,500.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985	1986(p)
UNITS								
TOTAL	828	931	837	445	158	199	243	253
Gear Tooth Finishing Machines(a)	646	432	254	160	90	103	164	253
Gear Hobbers-Horizontal and Vertical(b)	182	499	583	285	68	96	79	
All Other Gear Cutting Machines	(c)	(c)	(c)	0	0	(c)	(c)	0
VALUE (Millions of Dollars)								
TOTAL	$111.2	$130.3	$133.1	$86.5	$35.8	$42.4	$51.8(p)	$57.3
Gear Tooth Finishing Machines (a)	91.3	69.0	55.3	39.9	24.8	24.3	34.6	57.3
Gear Hobbers-Horizontal and Vertical (b)	36.4	19.9	61.3	77.9	46.7	10.9	17.2	
All Other Gear Cutting Machines	(c)	(c)	(c)	0	0	(c)	(c)	0

p - Preliminary.

(a) Includes bevel gear generators.
(b) Includes gear shapers.
(c)- Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985(r)	1986(p)
UNITS								
TOTAL	44,697	34,898	27,195	17,046	13,094	12,051	9,384	8,171
Unit Value Under $2,500	41,476	31,474	24,129	15,491	12,269	11,078	8,385	6,756
Unit Value $2,500 and Over	3,221	3,424	3,066	1,555	825	973	999	1,415
Vertical Drilling Machines	1,339	1,089	892	546	298	342	310	291
Radial Drilling Machines	226	232	331	163	122	100	165	125
Deep Hole Drilling Machines	184	190	154	110				
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	378	628	522	386	225	216	325	878
Automatic Drilling All Other	797	(a)	(a)	272	180	315	199	121
All Other Drilling Machines	297	1,285	1,167	78				
VALUE (Millions of Dollars)								
TOTAL	$150.5	$186.9	$139.9	$65.9	$41.1	$37.2	$38.2	$41.5
Unit Value Under $2,500	25.9	18.6	20.2	12.0	11.3	9.7	8.8	10.0
Unit Value $2,500 & Over	124.6	148.3	119.8	53.9	29.8	27.5	29.4	31.5
Vertical Drilling Machines	18.2	22.7	22.1	6.7	6.9	5.0	4.0	3.3
Radial Drilling Machines	9.7	12.6	14.0	5.3	7.4	7.1	10.3	8.1
Deep Hole Drilling Machines	5.8	10.6	15.7	10.4				
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	21.1	26.2	20.1	10.7	6.6	7.4	8.0	14.0
Automatic Drilling All Other	57.0	(a)	(a)	15.6	8.8	8.0	7.2	6.1
All Other Drilling Machines	18.6	76.2	47.8	5.2				

p - Preliminary. r - Revised.

(a) Included with "All Other Drilling Machines."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units, 1980 to Date

Products	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS TOTAL	17,937	16,904	4,508	3,695	4,300	3,836	3,051
NUMERICALLY CONTROLLED							
UNIT VALUE OVER $2,500							
Turning Machines-Horizontal Spindle							
Small	1,532	977	775	793	1,005	1,076	891
Medium	768	541	308	194	252	164	112
Large	224	266	212	116	75	104	68
Turning Machines-Vertical Spindle Turret & Boring Machines over 30" All Other	215	237	194	99	165	76	92
NON-NUMERICALLY CONTROLLED							
UNIT VALUE UNDER $2,500	D	D	247	250	310E	16E	20E
UNIT VALUE $2,500 and Over	D	D	2,772	2,243	2,493E	2,400	1,868
Mfg, Tool Room and Engine & Tool Room (Light and Heavy)							
Floor Mounted							
0" to 16" Swing Over Cross Slide	2,211	2,657	1,374	1,184	344(a)	278(a)	D
17" and Over All Other Engine & Tool Room Lathes	246	240	157	63	72	D	D
Turret Lathes							
Horizontal Type	1,063	D	D	422	D	D	D
Automatic Lathes-Single Spindle							
Bar (Screw) Machines	D	D	D	D	D	D	D
Chucking Machines	561	357	142	D	D	D	D
Automatic Lathes-Multiple Spindle							
Bar (Screw) Machines	848	809	293	233	334	231	169
Chucking Machines	176	131	54	D	D	D	D
Automatic Between Center Lathes All Other Horizontal Turning Machines	115	182	62	13	D	D	D
Vertical Turret Lathes and Boring Machines	D	D	D	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D	D

D - Withheld to avoid disclosure. r - Revised. p - Preliminary. E - Estimated by NMTBA.

(a) Includes "Over 8 inches to 16 inches" only.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Value, 1980 to Date

Products	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
VALUE (Millions of Dollars)							
TOTAL	$827.0	$616.8	$507.3	$320.9	$307.6	$318.7	$261.7
NUMERICALLY CONTROLLED							
AVERAGE OVER $2,500							
Turning Machines-Horizontal Spindle							
Small	$167.0	$134.2	$87.9	$84.1	$108.1	$131.9	$105.9
Medium	168.5	128.7	74.8	41.1	47.2	31.4	20.5
Large	64.5	83.7	75.8	48.0	22.5	26.4	17.1
Turning Machines-Vertical Spindle	81.1	94.8	94.8	51.3	29.9	35.5	44.5
Turret & Boring Machines over 30"							
All Other							
NON-NUMERICALLY CONTROLLED							
UNIT VALUE UNDER $2,500	D	D	0.5	0.7	1.1E	(b)	(b)
UNIT VALUE $2,500 and Over	D	D	173.4	95.7	98.7E	93.4	73.6
Mfg. Tool Room Lathes and Engine & Tool Room (Light and Heavy)							
Floor Mounted							
0" to 16" Swing Over Cross Slide	26.2	27.9	20.5	15.9	5.9(a)	3.0(a)	D
17" and Over	29.0	27.8	20.5	9.5	10.4	D	D
All Other Engine and Tool Room Lathes							
Turret Lathes							
Horizontal Type	17.3	D	D	6.8	D	D	D
Automatic Lathes-Single Spindle							
Bar (Screw) Machines	D	D	D	D	D	D	D
Chucking Machines	32.8	26.1	8.4	D	D	D	D
Automatic Lathes-Multiple Spindle							
Bar (Screw) Machines	89.9	99.6	40.7	24.3	29.6	28.4	18.8
Chucking Machines	33.5	30.9	14.1	D	D	D	D
Automatic Between Center Lathes	25.8	46.8	15.7	2.6	D	D	D
All Other Horizontal Turning Machines							
Vertical Turret Lathes and Boring Machines	D	D	D	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D	D

D - Withheld to avoid disclosure. r - Revised. p - Preliminary. E - Estimated by NMTBA.

(a) Includes "Over 8 inches to 16 inches" only.
(b) Value Less than $50,000.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (d)
Units, 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985(r)	1986(p)
UNITS								
TOTAL	107,288	97,004	91,548	58,362	56,864	60,189	51,807	54,759
Unit Value Under $2,500	89,238	79,509	76,687	48,651	50,512	51,614	42,647	46,532
Unit Value $2,500 and Over	18,050	17,495	14,861	9,711	6,352	8,575	9,160	8,227
External Cylindrical Grinding Machines								
Plain	325	297	383	394	140	104	93	77
Universal	313	305	291	302	242	216	208	166
Roll and Centerless } All Other External (a) }	821	935	880	637	378	366	538	535
Internal Cylindrical Grinding Machines	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Surface Grinding Machines								
Rotary Table Type	397	348	264	152	120	137	117	84
Reciprocating Table Type								
Vertical and Horizontal	2,217	2,941	1,850	1,270	862	1,042	1,031	652
Hand Surface Type }	3,147	3,523	1,822	1,310	1,251	1,708	1,646	1,297
Planer Type and All Other }		(b)	(b)	(b)	(b)	(b)	(b)	(b)
Bench, Floor and Snag Grinders	728	537	484	469	316	460	407	322
Tool and Cutter Grinding Machines	2,367	2,610	2,818	1,568	851	955	1,333	1,695
Polishing and Buffing Machines								
Stand, drum & disc types	543	326	309	(b)	(b)	332	314	310
All Other Polishing	2,083	1,581	1,501	650	501	812	885	947
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	2,154	1,871	1,486	1,002	(b)	(b)	(b)	1,004
Flat Surface Lapping Machines	447	247	224	165	270	268	256	170
All Other Honing and Lapping Machines	535	370	354	(b)	(b)	(b)	(b)	(b)
All Other (c)	1,973	1,604	2,195	1,792	1,421	2,175	2,332	968

p - Preliminary. r - Revised.

(a) Includes chucking grinders.
(b) Included in "All Other."
(c) This item includes items not disclosed, see footnote (b).
(d) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (d)

Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985(r)	1986(p)
VALUE (Millions of Dollars)								
TOTAL	$474.9	$555.8	$615.4	$486.7	$280.8	$335.6	$415.0	$422.0
Unit Value Under $2,500	16.8	16.8	17.9	13.2	12.1	13.7	10.8	11.3
Unit Value $ 2,500 and Over	458.1	539.0	597.5	473.5	268.7	321.9	404.2	410.7
External Cylindrical Grinding Machines								
Plain	43.5	42.1	63.9	68.9	30.2	22.8	21.4	21.7
Universal	17.2	17.7	18.6	23.7	18.2	14.5	15.5	12.6
Roll and Centerless All Other External (a)	107.5	132.0	160.8	93.6	44.3	47.2	72.8	85.0
Internal Cylindrical Grinding Machines	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Surface Grinding Machines								
Rotary Table Type	35.3	36.7	36.5	21.4	19.2	21.9	17.0	16.4
Reciprocating Table Type								
Vertical and Horizontal	35.3	49.1	37.7	35.4	14.1	24.1	20.5	16.8
Hand Surface Type	16.8	21.6	13.8	11.2	8.3	13.9	11.5	9.2
Planer Type and All Other		(b)	(b)	(b)	(b)	(b)	(b)	(b)
Bench, Floor and Snag Grinders	7.5	6.2	7.3	3.5	2.2	7.6	5.0	8.4
Tool and Cutter Grinding Machines	26.0	32.5	36.4	31.1	28.4	35.0	55.2	60.2
Polishing and Buffing Machines								
Stand, drum & disc types	10.9	5.8	8.6	(b)	(b)	4.6	6.2	4.9
All Other Polishing	24.1	28.7	33.2	24.4	14.4	22.4	25.1	31.3
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	20.4	29.1	28.3	23.0	(b)	(b)	(b)	32.7
Flat Surface Lapping Machines	6.3	5.0	4.0	4.3	5.9	10.4	8.9	6.2
All Other Honing and Lapping Machines	10.7	11.7	13.9	(b)	(b)	(b)	(b)	(b)
All Other (c)	96.6	120.8	134.5	133.0	83.5	97.5	145.1	105.3

p - Preliminary. r - Revised.

(a) Includes chucking grinders.
(b) Included in "All Other."
(c) This item includes items not disclosed, see footnote (b).
(d) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS TOTAL	70,922	76,770	77,220	39,946	18,246	19,308	19,804	15,436
Unit Value Under $2,500	59,852	64,819	64,347	29,990	9,609	10,816	11,009	7,882
Unit Value $2,500 and Over	11,070	11,951	12,873	9,956	8,637	8,492	8,795	7,554
Broaching Machines	295	269	204	166	120	143	144	126
Planers, Shapers (Except Gear) and Slotters	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Sawing and Cutoff Machines								
Power Hack Saws	453	556	509	562	1,032	617	124	137
Circular Cutoff Saws	134	142	145	100	102	140	168	(a)
Abrasive Cutoff Saws	499	526	497	322	219	166		
Band Saw	3,874	4,223	5,316	4,066	2,971	3,565	4,418	3,108
Contour Sawing and Filing Machines	970	619	840	1,228	1,180	817	1,349	874
All Other								
Tapping Machines	303	286	412	373	460	704	206	(a)
Transfer Machines								
Dial or Rotary	130	451	491	270	270	318	239	297
Way Type	91	126	64	54	46	(a)		
Station Type, Transfer	574	517	439	346	138	173	192	229
Other, N.E.C.	203	218	185	122	121	(a)	100	138
Electrical Discharge Machines (EDM)	1,857	2,234	1,725	1,113	1,055	1,082	1,027	938
Electrochemical Machines (ECM)								
All Other Metal Cutting Machines (b)	1,687	1,784	2,046	1,234	923	767	828	1,707

p - Preliminary. r - Revised.

(a) Included with "All Other."

(b) Includes items not disclosed due to confidentiality considerations, see footnote (a).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
VALUE (Millions of Dollars)								
TOTAL	$836.6	$1,092.2	$1,191.5	$977.3	$460.5	$476.3	$584.2	$769.3
Unit Value Under $2,500	28.6	31.7	25.7	14.8	7.2	9.6	10.3	8.8
Unit Value $ 2,500 and Over	808.6	1,060.5	1,165.8	962.5	453.3	466.7	573.9	760.5
Broaching Machines	31.6	33.6	36.0	38.3	15.1	19.6	18.9	22.8
Planers, Shapers (Except Gear) and Slotters	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Sawing and Cutoff Machines								
Power Hack Saws	3.4	3.4	3.2	3.4	5.2	3.2	0.9	1.2
Circular Cutoff Saws	10.6	11.6	22.2	5.1	2.3	2.9	6.1	(a)
Abrasive Cutoff Saws	3.1	4.7	5.5	3.5	2.4	2.3		
Band Saws	43.6	50.9	56.8	49.6	29.1	36.7	44.6	31.5
Contour Sawing and Filing Machines	18.4	20.5	24.0	37.1	24.7	16.3	26.5	18.1
All Other								
Tapping Machines	4.8	6.7	7.2	7.7	7.0	13.1	15.3	(a)
Transfer Machines								
Dial or Rotary	29.9	80.0	70.1	48.0	25.6	35.7	45.3	131.8
Way Type	22.2	32.8	38.7	57.8	25.6	(a)		
Station Type, Transfer	494.9	592.6	684.5	540.4	153.4	221.8	290.1	315.6
Other, N.E.C.	60.6	108.1	102.8	84.9	69.5	(a)	70.7	108.3
Electrical Discharge Machines (EDM) Electrochemical Machines (ECM)	45.7	78.1	66.9	35.8	48.5	30.1	32.1	33.2
All Other Metal Cutting Machines (b)	39.2	37.6	47.8	51.0	44.9	85.0	23.5	98.0

p - Preliminary. r - Revised.

(a) Included with "All Other."

(b) Includes items not disclosed due to confidentiality considerations, see footnote (a).

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS

Units and Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(p)
UNITS TOTAL	2,132	2,081	1,396	1,005	1,237	1,077	904
Unit Value over $2,500							
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	298	263	249	133	(a)	(a)	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)							
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)	(a)	452	341	295
Y-axis Travel 20 Inches to 26 Inches	531	539	309	210	241	224	175
Y-axis Travel Over 26 Inches	238	280	193	91	122	96	58
Drill, Mill, Bore-Horizontal (Automatic Tool Change)							
Y-axis Travel Less Than 27 Inches	434	429	237	114	171	143	(a)
Y-axis Travel 27 Inches to 40 Inches	205	233	166	64	71E	139E	59
Y-axis Travel Over 40 Inches	138	127	107	36	19E	51E	94
All Other Machining Centers (b)	288	210	135	357	161E	127E	223E
VALUE (Millions of Dollars) TOTAL	$413.0	$482.7	$357.6	$182.9	$213.2	$214.7	$204.1
Unit Value over $2,500							
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	32.1	32.4	33.2	18.5	(a)	(a)	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)							
Y-axis Travel Less than 20 Inches	(a)	(a)	(a)	38.4	38.4	30.8	25.3
Y-axis Travel 20 Inches to 26 Inches	73.8	84.7	48.1	28.3	32.5	32.0	24.8
Y-axis Travel Over 26 Inches	46.7	59.4	39.8	17.6	24.0	22.1	13.6
Drill, Mill, Bore-Horizontal (Automatic Tool Change)							
Y-axis Travel Less Than 27 Inches	92.2	106.7	72.3	29.9	46.8	37.2	(a)
Y-axis Travel 27 Inches to 40 Inches	64.1	88.3	66.4	26.3	34.5E	70.4E	22.5
Y-axis Travel Over 40 Inches	75.9	80.8	79.7	27.2	16.3E	6.7E	66.3
All Other Machining Centers (b)	28.2	30.4	18.1	35.1	20.7E	15.5E	51.6E

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Included in "All Other Machining Centers."

(b) This item includes "All Other Machining Centers" and those items not disclosed due to confidentiality considerations, see footnote (a).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985(r)	1986(p)
UNITS								
TOTAL	15,553	17,098	17,193	7,737	7,247	7,981	8,308	7,990
Unit Value Under $2,500	1,693	1,640	1,349	921	1,036	450E	320E	745E
Unit Value $2,500 and Over	13,860	15,458	15,844	6,816	6,211	7,533E	7,986E	7,245E
Knee Type Milling Machines	13,216	14,852	15,275	6,507	5,969	7,352E	7,793E	7,042E
(Except Bench)								
Horizontal								
Plain								
Universal								
Vertical & All Other Knee								
Ram Type								
Bed Type Milling Machines								
Profile Machines and Duplicators	210	279	286	309	242	179	186	203
Die Sinking Machines	229	327	283					
All Other Milling Machines	205							
VALUE (Millions of Dollars)								
TOTAL	$279.8	$339.3	$436.6	$265.6	$146.5	$179.9	$180.6	$161.2
Unit Value Under $2,500	1.0	1.0	1.0	0.6	0.8	1.1E	0.6E	1.1E
Unit Value $2,500 and Over	278.9	338.3	435.6	265.0	145.7	178.8E	180.0E	160.1E
Knee Type Milling Machines	174.1	215.1	231.3	109.3	98.4	118.8E	96.2E	82.4E
(Except Bench)								
Horizontal								
Plain								
Universal								
Vertical and All Other Knee								
Ram Type								
Bed Type Milling Machines								
Profile Machines and Duplicators	66.9	96.8	157.3	155.7	47.3	60.0	83.8	77.7
Die Sinking Machines	2.2	26.3	47.0					
All Other Milling Machines	35.7							

E - Estimate by NMTBA. p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1981 to Date
(Millions of Dollars)

Products	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS						
TOTAL	17,193	7,737	7,247	7,961	8,308	7,990
Unit Value Under $2,500	1,349	921	1,036	450E	320	745E
Unit Value $2,500 and Over	15,844	6,816	6,211	7,531E	7,988	7,245E
General-purpose, knee or bed:	14,071	5,850	5,445	D	D	D
Horizontal plain, universal and ram						
Vertical, except ram						
Vertical ram						
All other general-purpose type milling machines						
Automatic and manufacturing:						
Single spindle	356	228	177	197	143	D
Multiple spindle and special-purpose machines	848	429	347	D	D	D
Profile machines and duplicators	286	309	242	179	186	203
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	283					
All other milling machines N.E.C.						
VALUE (Millions of Dollars)						
TOTAL	$436.6	$265.6	$146.5	$179.9	$180.6	$161.2
Unit Value Under $2,500	1.0	0.6	0.8	1.1E	.6	1.1E
Unit Value $2,500 and Over	435.6	265.0	145.7	178.8E	180.0	160.1E
General-purpose, knee or bed:	140.1	64.4	71.4	D	D	D
Horizontal plain, universal and ram						
Vertical, except ram						
Vertical ram						
All other general-purpose type milling machines						
Automatic and manufacturing:						
Single spindle	37.3	21.9	7.6	10.9	6.2	D
Multiple spindle and special-purpose machines	53.9	22.9	19.3	D	D	D
Profile machines and duplicators	157.3	155.7	47.3	60.0	83.8	77.7
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	47.0					
All other milling machines N.E.C.						

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Withheld to avoid disclosure.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Units and Value, 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS								
TOTAL	82,199	75,336	66,666	48,204	50,073	56,698	53,464	50,204
Punching, Shearing, Bending and Forming	47,805	46,017	40,602	29,738	31,251	35,104	33,324	29,809
Punching and Shearing (a)	5,745	5,396	5,423	3,736	2,784	3,164	3,708	3,382
Bending and Forming (a)	9,791	9,242	7,472	5,990	5,958	6,295	7,042	6,746
Presses	24,418	20,426	18,030	11,765	9,665	10,814	9,137	9,425
Presses (a)	7,432	5,764	4,123	3,147	2,419	2,722	2,611	2,671
Other Metal Forming Machine Tools	9,976	8,891	8,034	6,701	9,157	10,780	11,013	10,970E
VALUE (Millions of Dollars)								
TOTAL	$1,026.8	$1,096.0	$1,064.3	$863.6	$580.6	$738.1	$829.5	$780.5
Punching, Shearing, Bending and Forming	364.6	419.1	418.9	308.8	258.7	317.1	340.1	291.5
Punching and Shearing(a)	174.3	196.7	198.1	136.5	114.2	132.4	139.4	110.9
Bending and Forming(a)	171.2	202.6	200.5	156.5	127.0	165.4	166.7	164.9
Presses	434.0	440.8	429.6	344.8	160.8	230.1	254.0	290.2
Presses (a)	422.1	429.9	418.6	338.3	156.1	224.9	250.0	285.2
Other Metal Forming Machine Tools	228.2	236.1	215.8	210.0	161.1	190.9	235.4	198.8E

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Machine tools under $2,500 are not included so the individual items do not add to the totals.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES

Units and Value (a), 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	87	78	39	82	55	65	44	D
Column and Open Rod Type	433	443	347	268	141	219	236	96
Gap or C-Frame								
15 Tons and Under	571	546	483	450	366	137	83	439
16-35 Tons	58	63	55	99		29E	55	D
Over 35 Tons	166	140	98			56	62	58
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	34	1,137	702	569	D	D	615	D
All Other Hydraulic Presses	1,871							709
VALUE (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	$18.7	$16.7	$16.3	$30.0	$12.1	$14.2	$ 9.6	D
Column and Open Rod Type	9.2	11.7	8.5	7.3	7.4	13.2	9.3	$4.5
Gap or C-Frame								
15 Ton and Under	4.9	5.2	4.6	9.3	4.3	2.1	2.2	3.4
16-35 Tons	1.3	1.5	1.6	4.8		0.9E	1.6	D
Over 35 Tons	7.8	6.7	4.9			5.9	4.1	4.0
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	12.8	45.8	50.0	53.8	D	D	31.4	D
All Other Hydraulic Presses	30.7							17.8

p - Preliminary. D - Withheld to avoid disclosure. r - Revised. E - Estimate by NMTBA.

(a) Unit value $2,500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

SHIPMENTS OF MECHANICAL PRESSES
Units and Value (a), 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS								
Open Inclinable Gap Type								
50 Tons and Under	1,374	954	642	433	435	496	570	430
51 Tons to 120 Tons	1,000	717	444	255	205	269	243	205
120 Tons and Over	96	103	87	D	D	D		61
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under 201 to 300 Tons 301 Tons and Over	59	57	90	D	D	D	176	D
Two Point								
300 Tons and Under	313	244	154	137	D	152		72
301 Tons and Over	97	77	46					D
Automatic High Speed 50 Tons and Under 51 Tons and Over	622	575	389	327	310	471	340	227
Gap and Horn Type	322	352	242	162	52	D	67	37
Bulldozers and Transfer Feed Presses All Other Mechanical Presses	329	278	305	296	105	129	120	133
VALUE (Millions of Dollars)								
Open Inclinable Gap Type								
50 Tons and Under	$20.0	$15.9	$13.4	$ 9.6	$ 7.9	$ 9.2	$ 9.7	$ 8.2
51 Tons to 120 Tons	32.4	27.5	19.1	11.0	8.0	14.0	14.1	13.2
120 Tons and Over	6.4	7.6	8.0	D	D	D		3.0
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under 201 to 300 Tons 301 Tons and Over	13.9	13.2	20.7	D	D	D	50.9	D
Two Point								
300 Tons and Under	26.7	31.3	25.5	43.1	D	27.4		12.4
301 Tons and Over	43.5	48.1	39.4					D
Automatic High Speed 50 Tons and Under 51 Tons and Over	76.5	83.7	72.2	47.6	34.9	65.2	59.5	45.5
Gap and Horn Type	9.2	10.0	5.6	4.5	2.1	D	4.7	3.7
Bulldozers and Transfer Feed Presses All Other Mechanical Presses	108.1	104.9	129.0	103.3	21.3	24.7	52.9	78.2

p - Preliminary. D - Withheld to avoid disclosure. r - Revised.

(a) Unit value $2,500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES

Units and Value (a), 1979 to Date

Products	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	2,387	2,300	2,512	1,870	1,112	1,293	1,667	1,544
Punching Machines, Fixed Position & Two Axes Positioning Table	938	822	678	407	392	516	487	391
Plate Shearing Machines	1,618	1,481	1,352	942	875	906	1,144	979
Bar and Angle, and Rotary Shearing Machines	275	186	186	152	133	108	99	66
Other Power Operated Punching and Shearing Machines	527	607	695	365	272	341	311	402
Manually Operated Punching and Shearing Machines								
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	657	503	409	262	259	265	301	285
Bending Rolls, Angles, Bars and Shapes (Power)		231	300	116	D	(b)	D	D
Press Brakes (Power)								
Mechanical	588	824	548	415	574	371	1,035	1,116
Hydraulic	856	1,540	904	612	599	799	641	654
Hydro-Mechanical	622		350	262	D	314	D	148
Rotary Bending and Forming (Power)	1,655	1,275	1,200	1,051	1,483	1,675	1,979	1,896
Ram and Press Bending	1,487	1,287	1,017	819	360	347	D	D
Other Bending and Forming Machines (Power or Manual)	3,926	3,582	2,744	2,453	2,435	2,524	2,450	2,240
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$20.8	$21.7	$26.0	$21.4	$16.3	$15.6	$15.7	$13.5
Punching Machines, Fixed Position & Two Axes Positioning Table	81.4	95.1	84.8	45.7	48.5	72.2	67.0	43.6
Plate Shearing Machines	53.6	61.0	65.9	55.2	40.8	37.9	60.3	35.8
Bar and Angle, and Rotary Shearing Machines	3.3	1.6	3.0	1.8	2.0	1.0	.7	.5
Other Power Operated Punching and Shearing Machines	15.2	17.4	18.3	12.3	6.6	5.8	11.4	17.4
Manually Operated Punching and Shearing Machines								
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	34.1	24.2	25.7	13.9	5.7	6.0	8.5	6.1
Bending Rolls, Angles, Bars and Shapes (Power)		13.1	15.9	13.3	D	(b)	D	D
Press Brakes (Power):								
Mechanical	10.8	15.2	12.5	7.7	11.1	8.6	10.4	13.1
Hydraulic	30.0	50.8	40.7	28.0	20.3	37.9	29.0	31.8
Hydro-Mechanical	10.0		9.1	5.8	D	7.1	D	4.1
Rotary Bending and Forming (Power)	19.3	26.4	23.6	24.4	22.3	39.3	30.8	26.6
Ram and Press Bending	16.1	14.3	15.1	11.4	8.5	7.6	D	D
Other Bending and Forming Machines (Power or Manual)	51.0	58.6	57.9	52.1	41.7	58.9	60.2	58.7

D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Unit value $2,500 or over.
(b) Included in "Rotary Bending & Forming (Power)."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS
Units and Value (a), 1979 to Date

Products	1979	1980	1981	1982	1983	1984	1985(r)	1986(p)
UNITS								
Forging Machines	609	631	479	383	263	198	213	140E
Riveting Machines (Except Portables)	3,246	2,025	1,764	1,320	1,592	1,759	1,972	2,018
Thread Rolling Machinery	233	202	150	111	80	160	245	491
Die Casting Machines								
Under 500 Tons	90	123	112	75	102	170	167	139
501 Tons and Over	136	94	56	31				
Spinning Lathes	2,851	2,766	2,326	1,939	1,808	2,357	2,038	1,745
Marking Machines, Knurling Machines								
Electroforming & Others								
Metal Container Making Machines				1,349	1,105	949	806	698
VALUE (Millions of Dollars)								
Forging Machines	$84.7	$73.8	$79.0	$79.0	$48.0	$29.0	$35.4	$17.2E
Riveting Machines (Except Portables)	15.8	21.9	24.3	14.6	12.7	18.5	26.1	19.1
Thread Rolling Machinery	9.4	8.9	8.5	7.2	5.0	12.3	18.6	39.8
Die Casting Machines								
Under 500 Tons	7.6	12.4	11.5	8.0	18.4	38.0	44.9	35.3
501 Tons and Over	30.9	27.1	15.1	8.7				
Spinning Lathes	75.3	88.0	73.1	46.1	35.2	44.3	50.3	43.2
Marking Machines, Knurling Machines								
Electroforming & Others								
Metal Container Making Machines				44.0	37.2	43.1	54.4	38.7

p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Unit value $2.500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS

Value of Shipments, by Industry, by Type, 1977 and 1982

(Millions of Dollars)

	All Industries		Shipped by					
			Metal Cutting Machine Tool Industry SIC 3541	Metal Forming Machine Tool Industry SIC 3542	Special Dies, Tools Jigs, & Fixtures Industry SIC 3544	Machine Tool Accessories Industry SIC 3545	Metal Working Machinery N.E.C. Industry SIC 3549	Other Industries
	1977	1982	1982					
Metal Cutting Machine Tools								
Total	$2,561	$4,155	$3,877	$25	$ 4	$75	$31	$143
Boring Machines	94	199	194	—	D	D	D	D
Drilling Machines	109	67	53	D	—	D	D	D
Gear Cutting & Polishing	67	87	D	—	—	D	—	—
Grinding & Polishing	288	515	469	1	—	D	D	D
Lathes	456	524	515	D	D	D	D	D
Milling Machines	168	265	251	10	—	D	D	D
Other Machine Tools (a)	714	1,437	1,328	D	D	D	D	D
Parts Sold Separately (b)	502	892	824	7	2	20	6	34
Not Specified	163	169	D	—	—	—	—	D
Metal Forming Machine Tools								
Total	$1,115	$1,384	$ 43	$1,211	$ 9	$ D	$ D	$ D
Punching, Shear, Bending, and Forming Machines	280	317	D	287	D	—	4	D
Presses, incl. Forging Presses(c)	283	369	10	331	D	D	D	D
Other Metal Forming Tools	172	217	D	177	D	D	D	D
Parts & Rebuilt Machines	296	380	15	317	3	D	4	D
Not Specified	85	101	—	98	—	—	D	D

D - Withheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) In 1982, Forging Presses are included in "Other Metal Forming Tools."

Source: U.S. Bureau of the Census, "Census of Manufactures 1982; MC82(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products." In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS

Fiscal Years 1983 to Date

(Thousands of Dollars)

	Year ending June 30			
	1983	1984	1985	1986
Saws and filing machines	$ 2,055	$ 2,649	$ 1,965	$ 2,787
Machining centers and way type machines	14,981	22,485	19,171	13,178
Electrical and ultrasonic erosion machines	1,169	1,320	1,645	3,732
Boring machines	4,527	6,249	8,324	12,013
Broaching machines	5,000	5,675	68	1,228
Drilling machines and tapping machines	2,247	5,309	2,433	6,808
Gear cutting and finishing machines	661	269	435	1,236
Grinding machines	8,836	14,682	18,662	25,480
Lathes	22,220	27,241	17,796	27,008
Milling machines	11,963	10,372	12,630	12,089
Planers and shapers	123	242	660	374
Miscel. machine tools	5,799	5,755	3,616	2,280
Total metal cutting machine tools	$ 79,581	$102,248	$ 87,405	$108,213
Bending and forming machines	$ 4,022	$ 3,548	$ 7,410	10,824
Hydraulic and pneumatic presses	1,931	8,117	1,367	3,039
Mechanical presses, power driven	1,213	356	940	7,600
Manual presses	474	2,400	670	235
Punching and shearing machines	3,288	3,617	5,627	6,811
Forging machinery and hammers	2,616	1,479	289	2,753
Wire and metal ribbon forming machines	80	119	0	0
Riveting machines	46	54	358	226
Miscel. secondary forming & cutting mach.	-45,108	192	424	780
Total metal forming machine tools	$-31,438	$ 19,882	$ 17,085	$ 32,268
Total Machine Tools	$ 48,143	$122,130	$104,490	$140,481

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification."

U. S. MACHINE TOOL FOREIGN TRADE

Foreign trade in machine tools has been a fact of life in the world's metalworking markets since the beginning of the industrial era. As a preeminent producer, the U.S. machine tool industry has historically exported around 17% of its annual output. However, in recent years the U.S. industry's position as an export leader has been challenged by competitors from other industrial nations and from developing nations. As a result of the combined effects of the the decline in the dollar and the gradual economic recovery in the industrialized nations, U.S. machine tool exports have slowly turned around since 1984. Imported foreign machine tools have continued to increase their penetration of the U.S. market, registering record levels of imports in both 1985 and 1986.

After having peaked at a value of over $1 billion in 1981, U.S. exports of machine tools fell to $615 million in 1982, fell again to $406 million in 1983 and $409 million in 1984. Since then, exports of machine tools rose to $459 in 1985, an 11% gain, and then surged to $590 million in 1986. Imports also went through a cyclical pattern over this time. After reaching a record high of $1.49 billion in 1981, imports fell to $946 million by 1983, but registered a strong turnaround in 1984, rising 43% to $1.36 billion. This was followed by continued substantial growth in 1985 as imports rose by 28% to $1.7 billion, surpassing the previous record high. In 1986, imports again set a new record, rising 30% to over $2.2 million for the year. Since imports rose far more rapidly than domestic shipments during the past three years, the share of domestic market taken by imports continued to climb. From a level of 25% in 1981, the imports' share of American machine tool consumption rose to 50% for 1986.

As a result of the rapid growth of imports, the machine tool trade deficit reached a new record high in 1986. Standing at $635 million for 1982 and a slightly lower $540 million for 1983, the deficits for both years exceeded the total value of U.S. machine tool exports for the first time in the industry's history. These deficits, however, pale in comparison to 1986's deficit of $1.7 billion, a deficit that is 29% larger than the 1985 deficit and almost three times the value of U.S. machine tool exports. These deficits underscore the intensity of the international competitive pressures being felt by U.S. machine tool builders and bring into focus the reality of the world machine tool marketplace. Reestablishing its position in this world market is vital to the future of the U.S. machine tool industry.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value, or price, in the foreign country at the time of exportation and include the cost of containers and coverings as well as other charges and expenses incidental to placing the merchandise into condition for shipment to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

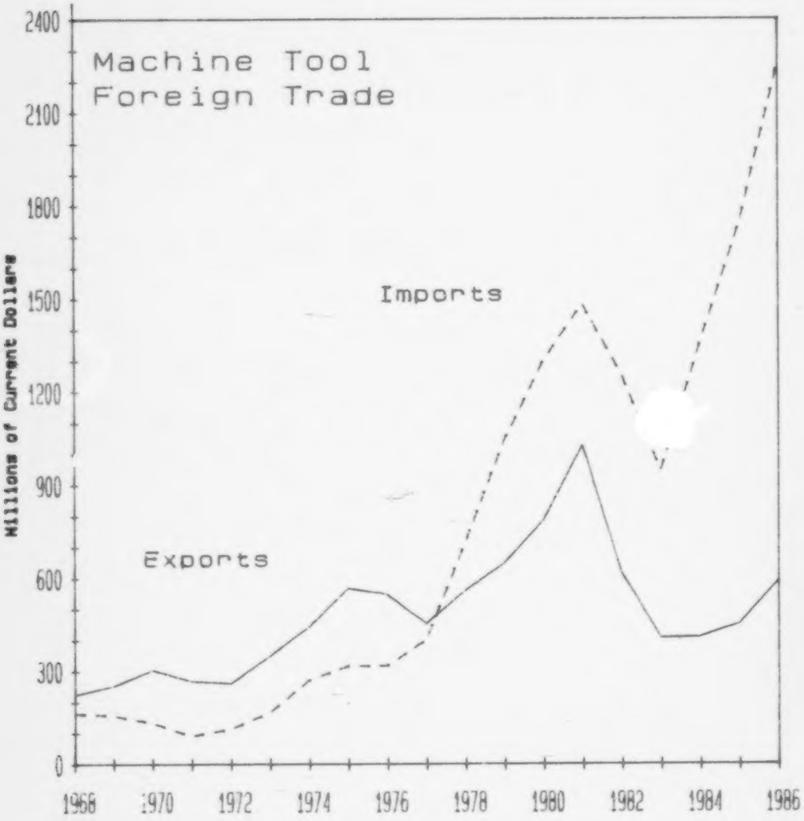
There are two additional export series with a more limited scope but considered more accurate by the industry.

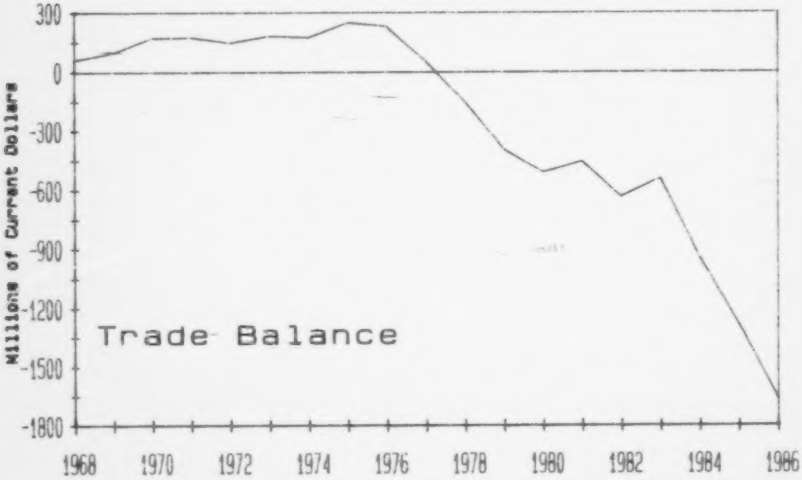
The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry (see Chapter 4 for details on this report).

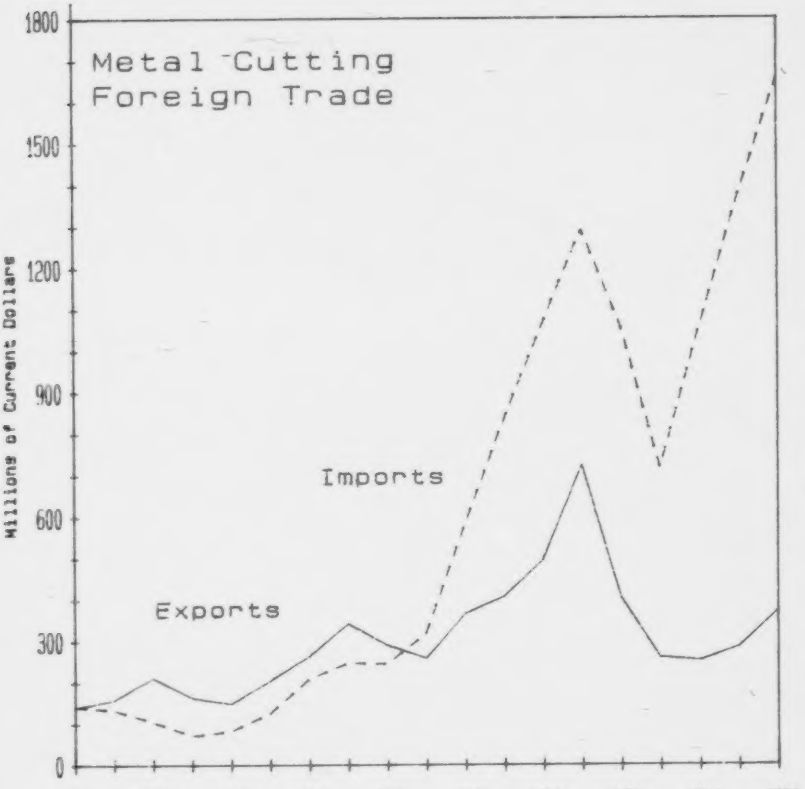
The other is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce (see Chapter 4 for details). This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward.

The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on exports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA import and Schedule B export classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data (MQ-35W, See Chapter 4), permitting the calculation of U.S. consumption of machine tools for a variety of product types.


Machine Tool
Foreign Trade
Imports
Exports
Millions of Current Dollars
2400
2100
1800
1500
1200
900
600
300
0
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986


Trade Balance
Millions of Current Dollars
300
0
-300
-600
-900
-1200
-1500
-1800
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986


Metal Cutting
Foreign Trade
Imports
Exports
Millions of Current Dollars
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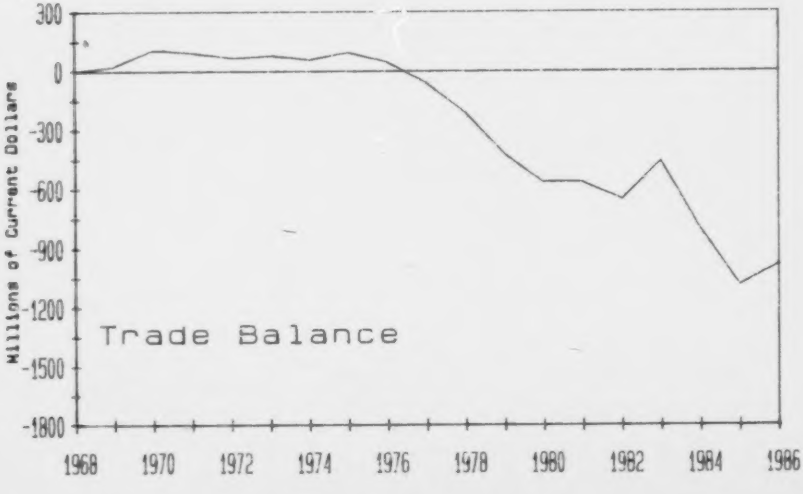
1500
1200
900
600
300
0
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986


Trade Balance
Millions of Current Dollars
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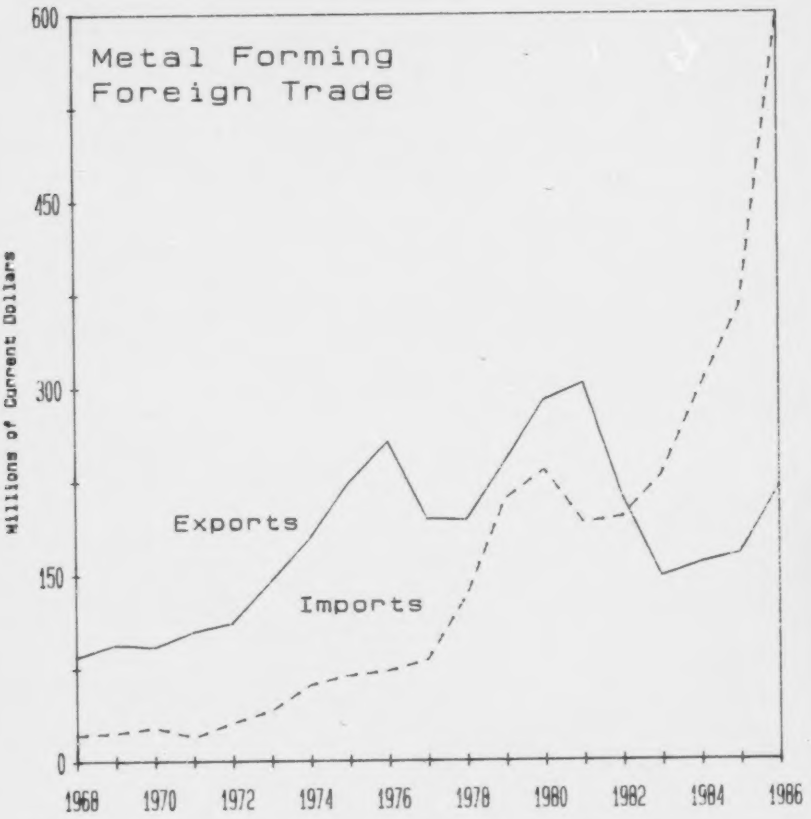
0
-300
-600
-900
-1200
-1500
-1800
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986


Metal Forming
Foreign Trade
Millions of Current Dollars
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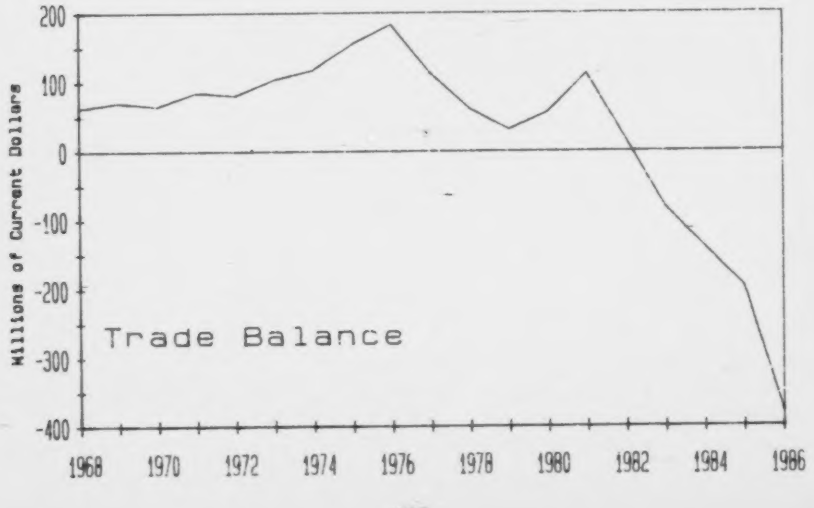
450
300
150
0
Exports
Imports
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986


Millions of Current Dollars
200
100
0
-100
-200
-300
-400
Trade Balance
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION

By Type of Complete Machines Valued Over $2,500, 1978 to Date

Machine Classification	1978	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
Machine Tools	20.6	22.6	23.3	24.9	26.4	33.7	37.9	41.1	49.0
Metal Cutting	21.6	23.0	23.6	26.1	27.4	33.6	39.3	43.2	48.1
Boring Machines	39.3	26.0	25.0	29.3	25.2	29.4	31.9	39.4	62.1
Drilling Machines	13.8	18.8	15.7	21.7	33.3	31.6	50.9	59.1	70.8
Gear Cutting Machines	31.7	32.9	29.8	31.1	28.1	36.7	41.9	39.5	60.1
Grinding Machines	NA	NA	23.4	22.6	22.6	28.9	30.1	29.9	35.2
Lathes	33.1	37.3	36.0	41.3	45.9	38.6	51.5	57.7	69.9
Milling Machines	22.6	24.5	30.2	23.9	26.5	28.5	34.8	45.4	45.7
Machining Centers	NA	11.3	20.8	31.3	36.9	49.3	56.0	63.0	66.3
Metal Forming	17.4	21.1	22.1	19.4	22.5	33.8	33.7	34.9	51.4
Punching & Shearing Machines	NA	NA	23.3	25.7	34.6	27.5	44.9	36.7	49.7
Bending & Forming Machines	NA	NA	17.5	16.3	20.7	24.5	27.0	35.2	48.9
Presses	NA	NA	16.0	11.6	12.4	29.3	27.2	28.5	51.2
Forging Machines	NA	NA	28.5	21.5	25.3	49.8	55.3	33.3	115.9
Total NC Machines	NA	NA	23.4	32.7	35.1	38.4	50.3	53.6	60.7

NA - Not Available. p - Preliminary. r - Revised.

Sources: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery," and U.S. Bureau of the Census, "IM 146" and "EM 522."

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF NEW COMPLETE MACHINE TOOLS (a), 1964 to Date

(Thousands of Dollars)

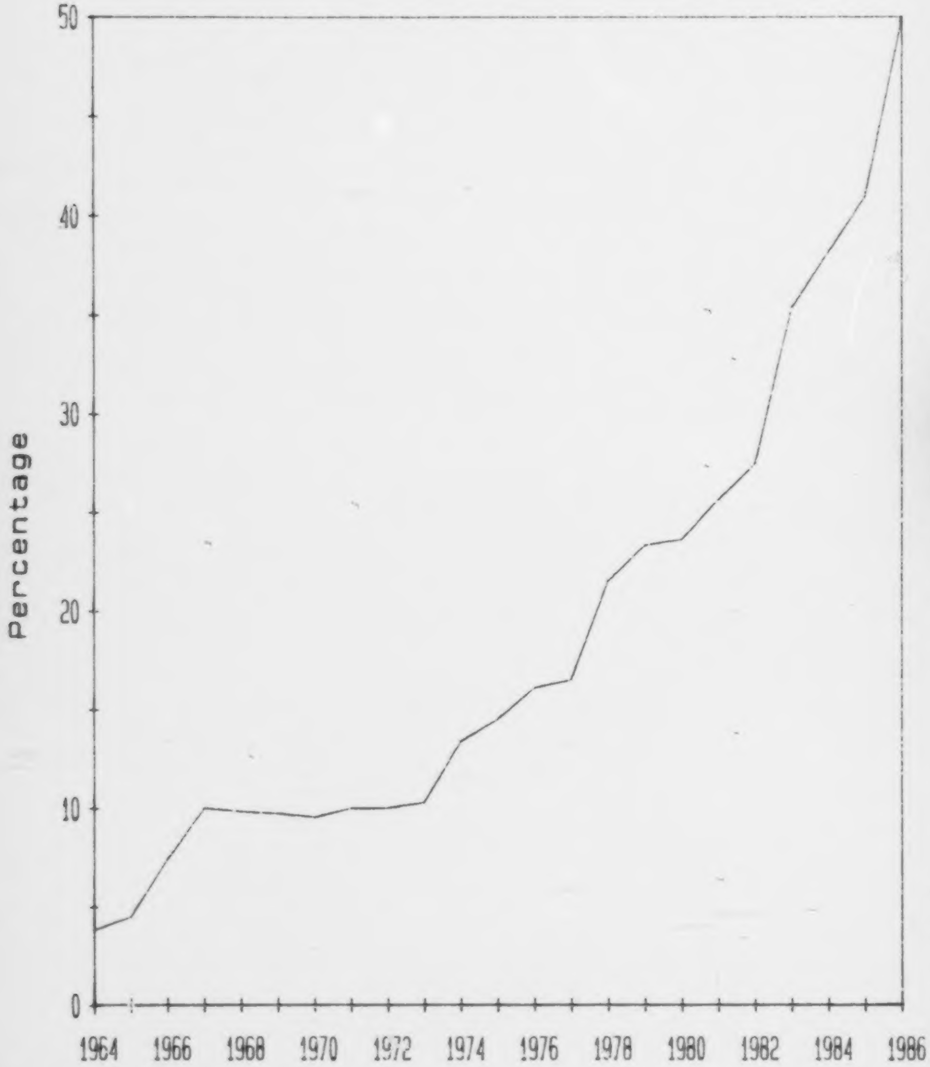
Year	Production	Exports	Imports	Domestic Consumption
1964	$1,185,380	$254,511	$ 36,364	$ 967,233
1965	1,429,650	222,437	56,293	1,263,506
1966	1,680,014	208,909	117,748	1,588,853
1967	1,826,432	224,672	178,205	1,779,965
1968	1,722,727	216,552	163,576	1,669,751
1969	1,692,188	242,427	156,122	1,605,883
1970	1,551,777	292,086	131,826	1,391,517
1971	1,057,870	251,532	90,085	896,423
1972	1,269,302	238,135	113,998	1,145,165
1973	1,787,850	325,494	167,057	1,629,413
1974	2,165,937	410,510	270,740	2,026,167
1975	2,406,082	536,659	317,578	2,187,001
1976	2,178,265	514,942	318,304	1,981,627
1977	2,453,423	426,729	400,904	2,427,598
1978	3,142,594	533,094	715,282	3,324,782
1979	4,064,045	619,111	1,043,768	4,488,702
1980	4,812,349	734,135	1,259,802	5,338,016
1981	5,111,253	949,553	1,431,457	5,593,157
1982	3,804,250	574,567	1,217,718	4,447,401
1983	2,144,849	359,037	921,083	2,706,895
1984(r)	2,426,382	373,457	1,318,964	3,368,770
1985(r)	2,717,814	400,453	1,688,693	4,017,570
1986(p)	2,779,907	546,610	2,217,050	4,450,347

p - Preliminary. r - Revised.

(a) These figures reflect data for machine tools of all values but do not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W," U.S. Department of Commerce Trade Statistics.

U.S. Machine Tool Imports as a Percentage of U.S. Machine Tool Consumption



U.S. IMPORTS OF MACHINE TOOLS (a)

Major Countries of Origin, 1975 to Date

(Millions of Dollars)

Country of Origin	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
TOTAL	$317.6	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9	$1,253.3	$946.5	$1,356.6	$1,738.5	$2,251.8
Austria	3.2	2.0	1.0	2.3	3.7	2.3	2.1	15.8	30.0	4.2	7.5	7.5
Belgium	6.4	3.1	4.9	8.0	12.6	16.7	18.5	9.1	7.1	6.7	10.3	12.7
Czechoslovakia	2.8	3.5	2.9	3.9	4.6	5.7	4.7	2.0	.6	1.7	.5	.5
Denmark	1.1	1.0	.7	2.5	3.3	3.7	2.9	2.2	2.8	5.2	4.7	4.1
France	16.2	9.5	9.7	17.4	21.4	24.9	26.5	12.9	10.5	13.9	19.2	36.9
Germany (East)	.6	.8	.7	1.8	1.9	2.0	2.9	3.1	2.1	1.5	1.4	1.8
Germany (West)	96.0	93.3	91.2	154.8	197.0	235.9	192.3	204.6	125.7	205.7	248.9	367.9
Italy	15.5	14.6	15.1	25.4	37.5	44.1	42.9	45.0	49.3	51.3	76.6	129.8
Netherlands	1.3	1.1	1.9	2.7	5.5	6.1	4.9	2.6	5.7	9.0	11.2	19.7
Norway	.4	.1	.6	.4	.6	.3	.8	1.0	.1	.9	1.5	.8
Poland	2.2	2.8	7.2	12.8	19.2	15.6	15.8	7.5	2.1	1.0	2.2	1.5
Spain	6.4	6.9	7.7	13.4	20.6	27.1	24.3	20.6	11.6	16.2	19.8	23.1
Sweden	9.9	8.4	11.5	18.3	31.3	29.3	28.3	23.4	15.3	19.2	29.0	22.6
Switzerland	27.0	28.6	35.3	57.6	66.0	81.5	78.4	71.8	54.7	78.4	95.2	115.3
United Kingdom	39.3	32.0	46.1	74.9	96.9	117.3	136.1	107.5	66.4	74.7	93.5	100.7
Canada	15.0	14.9	19.2	27.0	34.2	47.9	44.0	36.6	29.4	40.8	61.2	52.9
Japan	62.6	67.3	105.7	220.6	353.3	492.0	687.5	529.2	414.9	683.3	854.1	1,173.6
Taiwan	2.7	13.0	22.6	48.8	85.7	93.6	102.4	90.9	83.4	99.2	134.2	119.3
Other Countries	8.8	15.4	16.9	22.5	48.5	52.5	67.6	67.5	34.8	43.7	67.5	61.1

(a) Data does not include parts, but does include "Used and Rebuilt."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."

U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS (b)

Major Countries of Origin, 1975 to Date

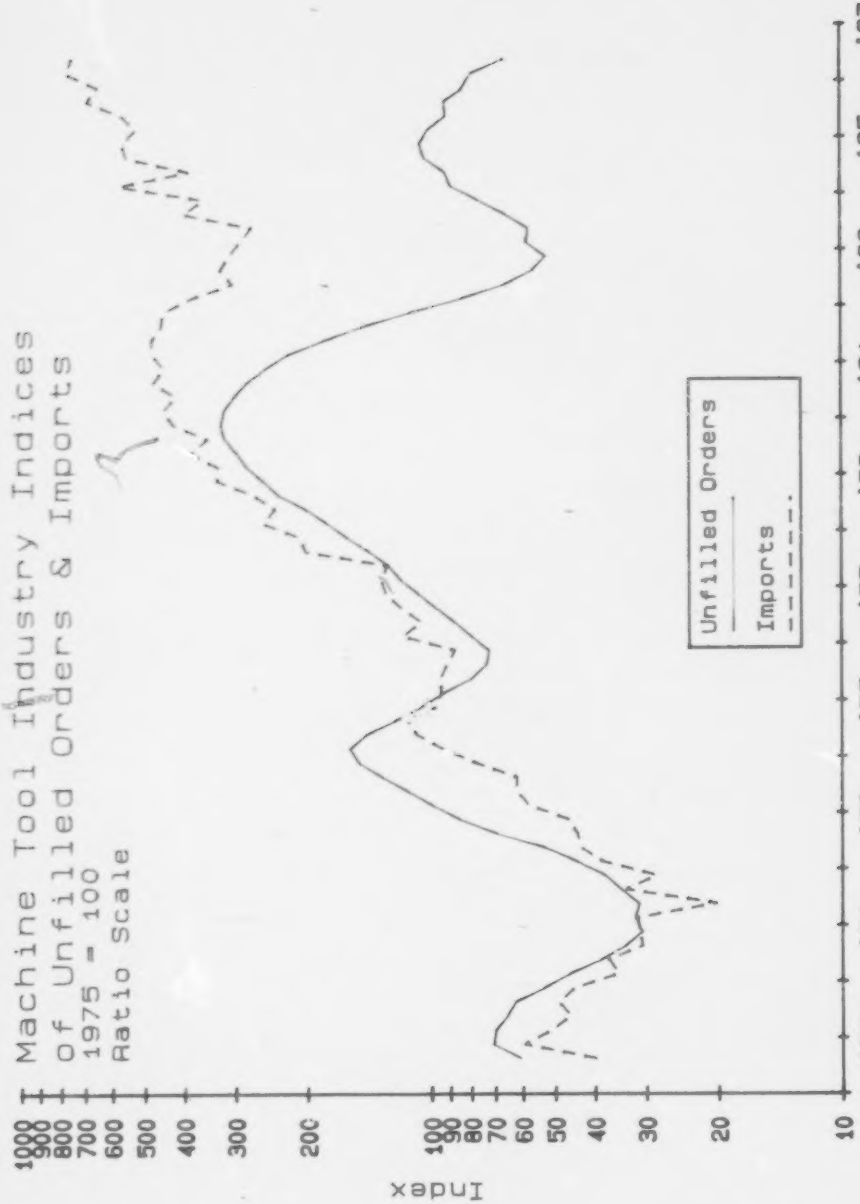
(Millions of Dollars)

Country of Origin	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
CUTTING TOTAL	$248.1	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5	$1,057.4	$716.9	$1,056.7	$1,374.7	$1,654.6
Austria	1.6	1.9	1.0	1.8	2.6	1.4	2.0	3.1	4.2	2.6	6.2	6.6
Belgium	2.6	1.2	4.3	4.5	6.2	8.0	10.8	5.6	3.0	.5	3.4	3.0
Czechoslovakia	2.8	3.5	2.9	3.9	4.4	5.5	4.6	2.0	.6	1.7	.5	.5
Denmark	.6	.9	.5	1.8	1.5	2.4	1.3	1.2	1.4	2.8	2.8	2.5
France	14.9	7.8	9.7	13.8	17.5	22.3	20.6	9.3	6.6	8.5	12.7	27.3
Germany (East)	.6	.7	.7	1.6	1.8	1.9	2.9	3.1	2.0	1.5	1.3	1.1
Germany (West)	69.0	59.7	60.3	104.0	117.0	150.2	148.4	155.0	91.6	137.1	186.7	279.6
Italy	11.3	11.3	11.1	19.6	23.9	34.2	31.6	36.5	21.4	38.5	45.3	92.3
Netherlands	1.0	1.0	1.0	2.4	4.3	5.4	4.3	2.1	2.6	5.9	7.4	17.1
Poland	2.2	2.8	7.2	12.6	19.1	15.5	15.8	7.5	2.0	1.0	2.2	1.5
Spain	6.0	6.2	7.3	13.0	18.9	24.3	21.9	19.0	9.5	13.6	17.9	19.4
Sweden	7.5	7.0	9.6	12.9	21.7	19.9	19.9	14.9	7.7	11.9	15.3	11.0
Switzerland	20.9	22.5	28.1	47.7	53.9	65.9	65.4	61.1	40.5	66.1	76.3	96.6
United Kingdom	34.2	27.8	39.2	64.0	86.7	103.8	120.5	94.1	56.6	60.8	67.1	77.4
Canada	8.5	8.9	11.0	16.2	18.1	29.1	28.2	22.4	12.7	17.2	30.4	23.3
Japan	53.1	54.8	89.1	193.7	305.9	433.4	627.4	467.8	340.0	550.6	721.4	841.8
Taiwan	2.7	12.8	22.5	47.9	85.3	93.1	101.6	89.9	82.4	97.3	130.4	116.1
Other Countries	8.6	14.5	13.7	20.6	44.3	48.1	64.3	62.8	31.9	38.8	47.4	37.5
FORMING TOTAL	$61.6	$69.4	$73.0	$81.7	$210.7	$234.1	$191.4	$196.0	$229.5	$299.9	$363.8	$597.2
Austria	.5	1.6	.1	(a)	1.1	.9	.1	12.8	25.7	1.5	1.3	.9
Belgium	3.6	3.8	1.9	.5	6.4	8.7	7.7	3.5	4.1	6.2	6.9	9.8
Germany (West)	25.0	27.0	33.6	30.9	80.1	85.7	44.0	49.6	34.1	68.6	62.2	88.3
France	1.8	1.4	1.7	2.4	4.0	2.5	5.9	3.6	3.9	5.4	6.5	9.6
Italy	5.2	4.2	3.2	4.0	13.6	9.9	11.3	8.6	27.9	12.8	31.3	37.5
Sweden	1.1	2.4	1.4	2.0	9.6	9.3	8.3	8.5	7.6	7.3	13.7	11.6
Switzerland	6.3	6.1	6.2	7.2	12.1	15.7	13.0	10.7	14.2	12.3	18.9	18.7
United Kingdom	4.4	5.1	4.2	6.9	10.2	13.6	15.6	13.5	9.8	13.9	26.5	23.3
Canada	5.0	6.5	6.0	8.3	16.1	18.8	15.8	14.2	16.7	23.5	30.8	29.6
Japan	6.4	9.5	12.5	16.6	47.4	58.6	60.1	61.5	74.9	132.7	132.7	331.8
Other Countries	.5	1.8	2.2	2.9	10.1	10.4	9.6	9.5	10.6	15.6	33.0	36.1

(a) Less than $50,000; included in "Other Countries."
(b) Data does not include parts. See previous page.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."



Machine Tool Industry Indices of Unfilled Orders & Imports

1975 = 100

Ratio Scale

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS

By Machine Classification, 1975 to Date

(Millions of Dollars)

Machine Classification	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GRAND TOTAL	$382.4	$383.3	$482.2	$832.4	$1,269.5	$1,556.9	$1,712.9	$1,489.4	$1,100.2	$1,652.7	$2,110.2	$2,682.9
METAL CUTTING	303.0	293.6	386.7	681.6	1,027.6	1,282.2	1,485.1	1,258.1	836.9	1,316.5	1,685.6	2,015.3
Complete Machines	248.1	245.3	319.2	582.2	833.1	1,064.4	1,291.5	1,057.4	716.9	1,056.7	1,374.8	1,654.6
Gear Cutting or Hobbing	20.7	16.9	13.5	25.9	28.4	29.4	37.0	25.8	13.8	18.1	20.5	32.6
Drilling	9.4	15.3	19.6	18.7	25.0	27.2	26.4	20.7	9.9	17.9	32.6	39.1
Milling	23.3	25.9	27.9	47.7	83.1	138.1	124.7	87.7	52.5	83.4	133.7	113.8
Machining Centers	(a)	(a)	(a)	22.0	39.6	93.4	195.7	188.9	164.9	248.0	330.0	394.3
Boring and Vertical Turret Lathes	41.1	41.0	51.8	65.9	70.7	76.9	86.7	78.8	44.6	49.7	50.4	119.6
Lathes (Exc. Vertical Turret Lathes)	77.0	77.0	113.9	219.4	353.6	380.0	479.8	338.6	165.7	268.1	350.3	391.1
Grinding	34.5	32.2	39.2	68.1	85.2	150.5	137.2	117.6	89.6	118.5	147.9	190.0
Other	42.5	37.1	53.3	63.6	82.4	84.4	87.2	98.7	72.8	129.4	169.8	246.3
Metal Cutting, $2,500 and Under	(b)	(b)	(b)	50.9	65.1	50.0	70.9	68.9	83.2	91.8	97.1	101.0
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	35.2	45.9	31.7	19.9	31.6	42.5	26.8
Parts	54.8	48.3	67.5	99.5	194.5	217.8	193.6	200.7	120.0	259.8	310.9	360.7
METAL FORMING	79.4	89.7	95.5	150.7	241.9	274.7	227.8	231.3	263.3	336.1	424.5	667.6
Complete Machines	69.4	73.0	81.7	133.1	210.7	234.1	190.4	196.0	229.5	299.9	363.8	597.2
Metal Forming, $2,500 and Under	(b)	(b)	(b)	4.1	4.5	3.9	4.5	4.6	5.2	8.1	9.2	10.1
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	3.5	5.5	3.9	5.5	6.0	7.4	7.9
Parts	10.0	16.7	13.8	17.6	31.2	40.6	36.3	35.4	33.8	36.3	60.7	70.4

(a) Included in "Other Metal Cutting Machine Tools."

(b) Included in respective machine classifications.

Note: Individual items may not add to totals due to rounding. This table is based on a set of classifications which was expanded in 1978 and again in 1980. A separate table on the following page reports import data for 1985 and 1986 using the more detailed machine tool categories.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1985 and 1986

(Value in Thousands of Dollars)

Machine Classification	1985		1986	
	Units	Value	Units	Value
GRAND TOTAL	1,068,872	$1,685,645(a)	904,891	$2,015,280(a)
Complete New Machines	1,060,391	$1,332,266	898,765	$1,627,796
Gear Hobbers	80	8,730	73	9,149
Gear Shapers	7	688	5	764
Gear Cutting Machines, N.E.C.	16	872	21	3,101
Vertical Mach. Ctrs. ATC NC, Y-Axis Travel 26" or Less	2,873	196,826	2,220	171,305
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	209	16,187	328	31,566
Horizontal Machining Centers, ATC, NC	717	81,032	715	89,382
Machining Center, NC, N.E.C.	389	35,918	774	69,504
Single Station and Multi-Station Transfer Machines	90	20,628	92	32,534
Way Type Machines (Unit Heads)	0	0	0	0
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	18	3,391	7	1,337
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	34	4,361	47	10,769
Vertical Boring-Drilling-Milling Machines, NC	140	9,582	245	19,034
Horiz. Boring-Drilling-Milling Machines, non-NC	23	1,468	23	1,683
Vertical Boring-Drilling-Milling Machines, non-NC	97	6,444	97	2,916
Drilling Machines, NC	[illegible]78	11,654	144	10,866
Drilling Machines, Multi-Spindle, non-NC	49	2,790	60	4,741
Drilling Machines, Radial, non-NC	441	2,738	245	2,094
Drilling Machines, Upright, Single Spindle, non-NC	61	927	111	776
Drilling Machines, non-NC, N.E.C.	585	14,446	706	20,605
Milling Machines, NC	473	41,302	804	57,295
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	58	4,427	22	1,214
Milling Machines, Knee Type, non-NC	4,182	23,890	3,530	19,920
Milling Machines, Bed Type, non-NC	363	24,572	333	6,664
Milling Machines, non-NC, N.E.C.	2,660	39,526	1,862	28,678
Vertical Boring Machines, incl. VTL's NC	26	4,700	78	10,636
Vertical Boring Machines, incl. VTL's, non-NC	141	2,610	210	4,419
Boring Machines, NC, N.E.C.	25	4,050	26	10,669
Boring Machines, non-NC, N.E.C.	468	13,772	507	58,150
Horizontal Lathes, Multi-Spindle, NC	NA	NA	42	4,214
Horizontal Lathes, Single Spindle, Less Than 25 HP, NC	3,121(b)	158,432(b)	3,741	158,022
Horizontal Lathes, Single Spindle, 25-50 HP, NC	802(b)	65,366(b)	911	63,266
Horizontal Lathes, Single Spindle, Over 50 HP, NC	63(b)	8,633(b)	292	23,889
Horizontal Engine & Toolroom Lathes, non-NC	4,365	34,901	3,941	32,288
Automatic Chucking Lathes, Single Spindle, non-NC	213	8,704	113	3,550
Automatic Chucking Lathes, Multi-Spindle, non-NC	157	6,041	130	12,064
Automatic Bar Machines, Single Spindle, non-NC	139	2,475	57	1,890
Automatic Bar Machines, Multi-Spindle, non-NC	51	4,063	20	3,063
Horizontal Lathes, non-NC, N.E.C.	281	6,507	232	10,014
Vertical Lathes, Multi-Spindle, NC	313	20,328	171	12,259
Vertical Lathes, NSPF, NC			461	29,558
Vertical Lathes, excl. VTL's, non-NC	2,413	34,805	1,656	37,037
Gear Tooth Grinding & Finishing Machines	198	10,195	458	19,607
Tool & Cutter Grinding Machines, NC	34	1,414	107	4,923
Tool & Cutter Grinding Machines, non-NC	1,324	17,608	1,269	20,135
Honing & Lapping Machines	248	8,437	246	14,196
Grinding Machines, Flat Surface, NC	62	4,542	50	8,336
Grinding Machines, Flat Surface Reciprocating Table, non-NC	954	12,801	415	6,147
Grinding Machines, Flat Surface, non-NC, N.E.C.	2,033	28,458	1,607	29,810
Grinding & Polishing Machines, NC, N.E.C.	112	11,476	116	13,245
External Grinding Machines, non-NC	248	13,224	811	19,836
Internal Grinding Machines, non-NC	112	4,772	107	5,458
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	270	10,150	194	9,757
Grinding Machines, non-NC, N.E.C.	1,349	35,034	1,689	58,118

Footnotes at the end of Table. (Continued)

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1985 and 1986

(Value in Thousands of Dollars)
(Continued)

Machine Classification	1985		1986	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	1,003	$ 54,243	867	$ 58,266
All Other Electrical Discharge Machines	432	20,879	542	24,640
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	104	5,399	65	4,975
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	211	6,058	202	5,542
Metal Cutting Machine Tools, NC, N.E.C.	29	3,666	192	92,097
Sawing & Cut-off Machines, non-NC	1,797	25,061	1,988	30,702
Broaching Machines, non-NC	61	3,311	68	1,746
Metal Cutting Machine Tools, non-NC, N.E.C.	1,260	30,506	1,159	28,272
Metal Cutting Machine Tools, Less Than $2,500	1,022,209	97,114	861,561	100,968
Metal Cutting Machine Tools, Used or Rebuilt	8,481	42,451	6,126	26,780
Parts	—	310,928	—	360,704

N.E.C. - Not Elsewhere Classified. NA - Not Available.

(a) The data may not add to totals due to rounding.
(b) Data includes both Single Spindle & Multi-Spindle machines.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1985 and 1986

(Value in Thousands of Dollars)

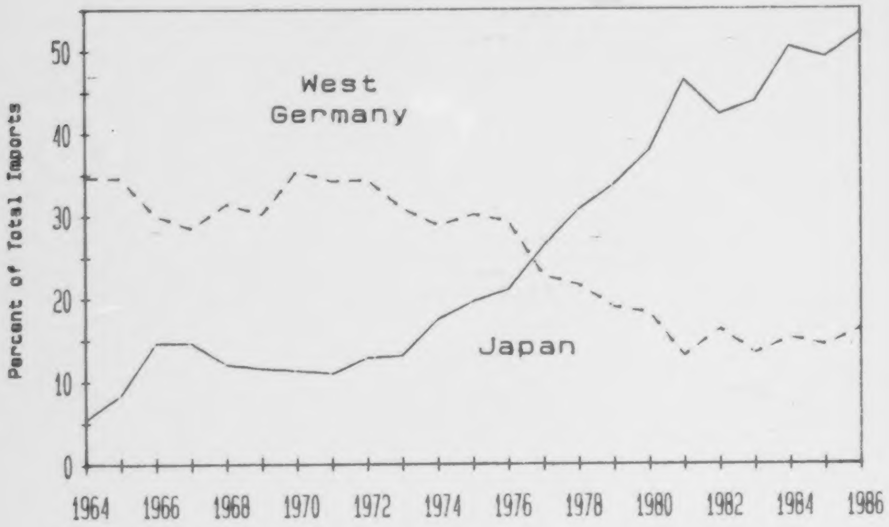
Machine Classification	1985		1986	
	Units	Value	Units	Value
GRAND TOTAL	81,147	$424,521(a)	36,085	$667,637(a)
Complete New Machines	80,533	$356,427	35,586	$589,254
Die Casting Machines	377	24,256	705	27,906
Punching & Shearing Machines, incl. Combination, NC	542	51,553	483	55,352
Shearing Machines, non-NC	892	16,010	1,082	21,028
Punching & Combination Punching & Shearing Machines, non-NC	809	11,869	683	12,039
Bending, Folding, Straightening & Flattening Machines, NC	270	15,496	394	35,158
Press Brakes, non-NC	1,198	26,064	1,083	30,114
Bending Rolls, Ram & Press Bending Machines, non-NC	208	2,519	202	2,790
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	1,283	26,030	1,288	34,589
Metal Forming Machine Tools, NC, N.E.C.	36	4,069	60	22,378
Mechanical Presses, non-NC	466	31,875	381	58,458
Hydraulic Presses, Vertical, Single Action, non-NC	118	11,172	84	7,733
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	492	39,975	946	166,750
Headers & Upsetters, non-NC	155	7,252	108	7,975
Forging Machines, non-NC, N.E.C.	115	4,291	145	9,974
Metal Forming Machine Tools, non-NC, N.E.C.	1,871	74,724	2,160	86,902
Metal Forming Machine Tools, Less Than $2,500	71,701	9,225	25,782	10,064
Metal Forming Machine Tools, Used or Rebuilt	614	7,361	499	7,943
Parts	—	60,733	—	70,440

N.E.C. - Not Elsewhere Classified.

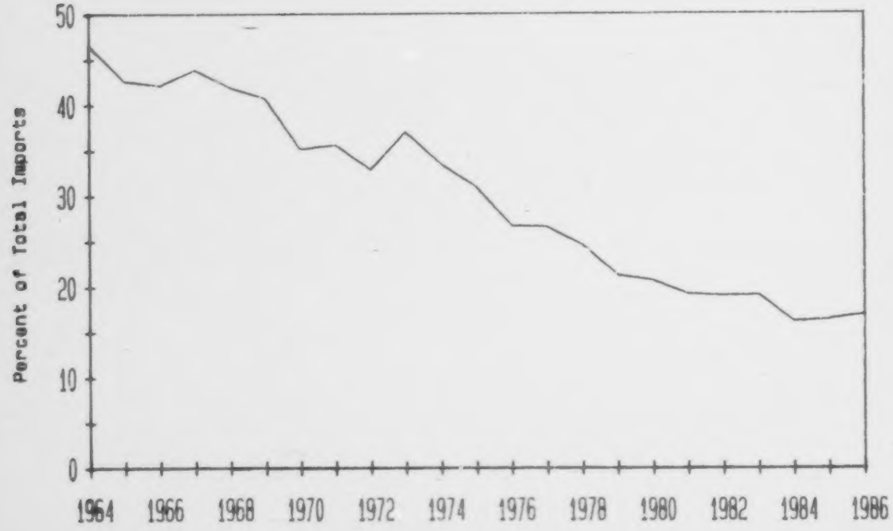
(a) The data may not add to totals due to rounding.

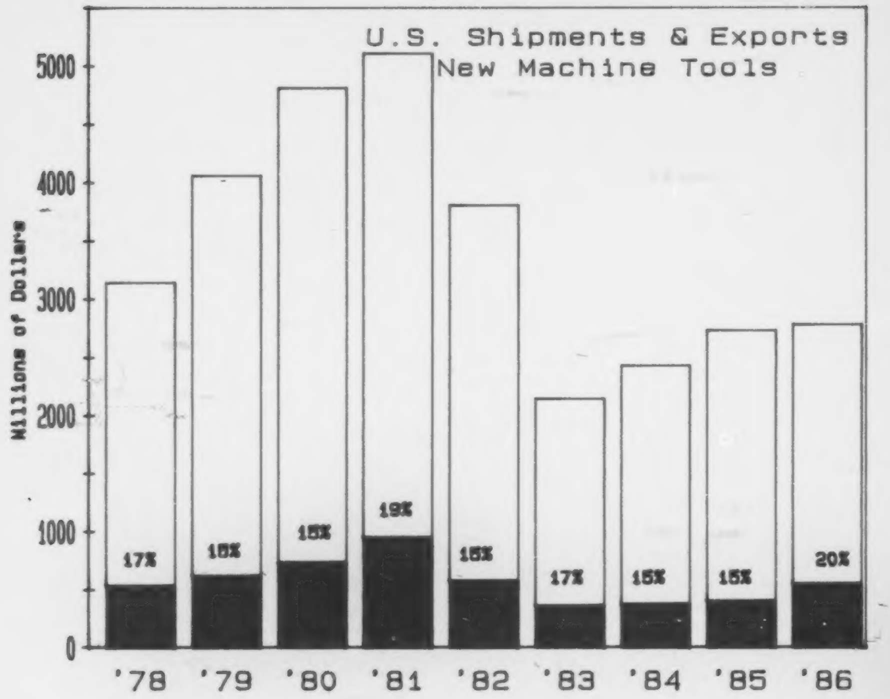
Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. Machine Tool Imports
From West Germany and Japan

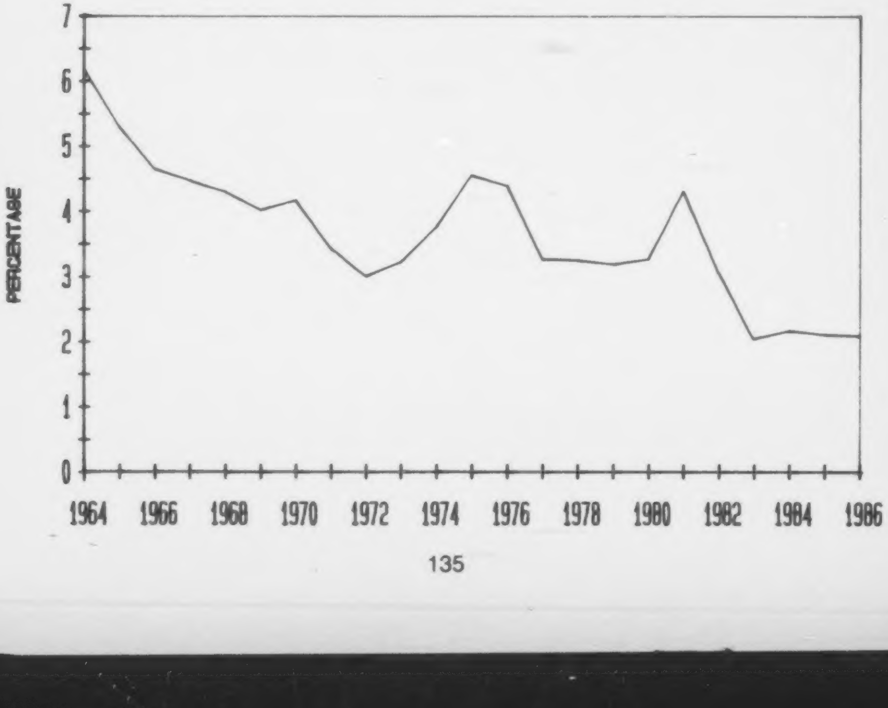


U.S. Machine Tool Imports from
France, Italy, Switz. & the U.K.





U.S. MACHINE TOOL EXPORTS
Percent of World Machine Tool Consumption



U.S. EXPORTS OF MACHINE TOOLS
Cutting and Forming By Destination, 1975 to Date
(Millions of Dollars)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GRAND TOTAL	$567.6	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6	$615.0	$406.0	$409.3	$452.4	$590.3
EUROPE	242.2	194.1	163.8	201.3	212.3	228.0	231.8	163.6	128.6	110.0	101.4	161.1
Austria	.5	1.5	1.8	.3	.9	1.8	1.3	1.2	2.3	.2	.7	1.1
Belgium	9.8	5.0	7.8	8.7	4.1	3.6	4.9	2.9	1.5	4.3	2.3	23.5
Denmark	1.2	2.1	2.5	1.7	3.1	3.1	1.3	1.4	.4	.8	1.0	.4
Finland	1.0	2.0	.9	.6	1.9	1.5	1.8	6.3	1.1	.4	8	.4
France	15.9	18.9	10.8	12.2	20.4	21.3	29.2	19.2	12.5	11.6	6.7	10.6
Germany, West	13.8	16.0	23.7	29.7	28.5	33.7	35.2	21.8	30.9	21.4	23.1	37.0
Greece	1.7	1.1	.5	1.2	4.5	1.1	1.4	1.6	.3	.3	.3	.1
Ireland	2.1	1.5	1.0	2.0	2.9	3.5	11.4	4.2	4.5	4.0	2.2	2.2
Italy	11.6	13.8	13.5	11.0	17.5	13.4	16.7	14.9	15.5	6.8	11.2	16.8
Netherlands	4.3	3.6	4.5	4.8	5.3	7.8	7.4	3.3	2.7	2.0	2.9	3.5
Norway	2.9	1.7	4.1	1.5	2.3	1.9	1.0	.6	.3	.9	.7	.8
Poland	7.9	13.5	8.2	24.2	3.1	2.1	(a)	.3	2.0	.6	1.1	.7
Portugal	.3	.7	.2	.3	.4	.4	2.1	.1	(a)	.3	.2	.2
Romania	1.9	1.6	4.8	21.0	6.6	3.3	1.5	3.3	(a)	0	0	0
Spain	28.2	5.8	4.3	3.7	4.6	13.5	14.2	6.3	2.1	2.7	3.7	3.2
Sweden	9.1	13.2	10.2	6.7	4.0	11.0	5.5	5.0	2.7	4.1	3.6	5.8
Switzerland	4.1	2.8	3.2	4.3	6.2	12.5	9.2	7.1	5.3	5.3	3.6	6.4
United Kingdom	34.8	38.3	26.6	46.4	83.7	62.9	64.1	59.8	35.0	40.8	31.2	43.3
U.S.S.R.	89.1	48.1	31.4	16.7	7.3	25.8	16.5	1.3	7.5	.6	1.2	1.3
Yugoslavia	1.5	2.2	1.6	3.6	3.6	2.1	4.8	1.1	.7	.9	.5	1.6
All Other	.5	.2	1.7	.4	.4	1.7	2.3	1.8	1.4	2.0	4.5	2.2
NORTH AND CENTRAL AMERICA	123.7	136.7	109.4	119.8	167.9	304.4	520.5	221.6	108.1	132.5	149.1	181.2
Canada	76.7	78.9	61.1	76.5	95.4	162.4	256.1	82.3	61.7	82.6	82.0	85.0
Mexico	40.3	52.9	42.0	36.9	67.7	135.7	258.9	135.9	42.5	45.7	63.8	93.9
All Other	5.1	4.1	5.1	5.4	4.8	6.3	5.5	3.3	3.8	4.2	3.4	2.3
SOUTH AMERICA	77.9	116.6	73.8	75.3	89.5	64.5	62.1	51.5	18.4	33.6	37.2	29.1
Argentina	4.0	4.3	3.2	10.8	8.0	13.8	7.7	8.2	1.9	3.7	1.1	1.2
Brazil	55.4	86.5	40.5	31.2	23.8	19.2	24.2	21.0	10.9	18.5	24.6	16.5
Chile	.6	1.3	1.1	1.2	2.3	2.3	2.2	2.0	.3	1.8	.1	1.7
Colombia	2.2	1.3	4.8	3.1	4.1	5.6	4.6	3.4	1.7	3.2	3.8	1.8
Ecuador	.9	1.5	2.4	2.5	4.0	1.6	3.9	1.3	.4	.5	.1	.4
Peru	2.0	2.1	1.0	.3	1.7	2.2	3.5	.9	.1	.4	.3	1.1
Venezuela	12.4	19.2	20.2	25.5	45.2	18.9	15.1	14.3	2.9	5.3	7.0	6.5
All Other	.4	.4	.6	.7	.4	.9	.9	.3	.1	.2	.1	(a)

Footnotes at the end of Table.

(Continued)

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1975 to Date

(Millions of Dollars)
(Continued)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
ASIA	$89.8	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6	$141.5	$131.6	$116.1	$138.0	$206.6
China	(a)	(a)	(a)	6.0	9.3	6.7	1.5	2.4	16.6	13.0	26.6	50.5
Hong Kong	.6	.7	1.2	2.3	1.6	4.0	10.2	2.5	2.2	3.1	4.5	2.2
India	3.0	2.5	4.2	6.9	4.4	9.7	15.2	15.4	5.4	6.4	6.6	9.9
Iran	6.3	12.1	9.7	21.0	1.9	0	(a)	1.0	(a)	.5	1.0	.1
Israel	5.8	3.9	3.9	4.1	10.9	12.4	7.7	6.8	7.0	8.2	5.4	5.0
Japan	38.5	27.0	22.1	39.0	48.3	59.1	54.2	51.0	35.7	39.4	36.2	52.1
Korea, Republic of	5.0	5.1	6.8	24.0	34.1	24.3	15.0	11.2	8.8	8.3	14.9	31.4
Philippines	6.4	1.8	1.5	1.4	2.6	3.3	3.2	5.2	2.0	1.3	1.2	.5
Saudi Arabia	(a)	(a)	(a)	9.1	15.2	10.9	14.9	17.3	21.8	12.1	3.0	9.2
Singapore	2.9	3.1	3.9	5.5	6.3	5.5	13.7	14.7	9.3	5.1	12.4	8.1
Taiwan	7.6	9.1	17.1	9.6	10.1	15.3	16.2	8.1	9.2	5.2	6.6	11.7
Turkey	2.7	1.0	.6	4.8	1.5	.4	1.4	1.2	3.4	6.7	6.8	18.4
All Other	11.0	12.9	16.5	5.6	5.6	7.2	10.3	4.8	10.2	6.9	12.9	7.4
OCEANIA	21.5	8.3	7.8	13.7	17.0	12.2	22.7	12.7	9.1	7.6	15.4	8.9
Australia	21.0	7.4	6.6	12.8	15.4	10.7	21.6	11.1	8.0	7.3	14.6	8.1
New Zealand	.5	.8	1.1	.8	1.6	1.4	.7	1.4	1.0	.3	.7	.7
All Other	(a)	.1	.1	.1	(a)	.1	.4	.1	.1	(a)	(a)	.1
AFRICA	12.4	11.6	9.8	10.6	10.2	17.3	6.9	24.0	10.1	9.4	11.1	3.3
Egypt	.1	.4	1.2	1.1	.9	2.5	6.3	3.9	2.2	4.0	2.7	.7
South Africa	9.1	7.7	4.9	6.4	5.6	11.8	16.9	10.5	5.4	3.8	4.6	1.5
All Other	3.2	3.5	3.7	3.2	3.7	3.0	3.7	9.6	2.4	1.6	3.8	1.1

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1975 to Date
(Millions of Dollars)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GRAND TOTAL	$343.1	$289.8	$257.7	$366.5	$408.0	$495.4	$724.0	$403.5	$258.3	$250.2	$285.9	$371.3
EUROPE	161.6	115.4	103.7	143.7	144.7	150.0	153.6	112.1	84.4	71.4	64.6	107.3
Austria	.2	1.2	1.3	.2	.8	1.4	1.2	1.0	1.9	.1	.6	.4
Belgium	5.3	2.8	5.5	5.5	2.2	.8	1.6	2.1	.8	3.3	1.4	20.9
Denmark	.6	1.9	1.8	.9	1.3	1.3	.5	.8	(a)	.4	.8	.2
Finland	.5	1.3	.1	.6	1.8	1.4	1.3	2.4	.3	.1	.8	.1
France	8.5	11.7	5.0	7.5	11.1	10.6	19.1	13.9	5.1	4.1	3.6	4.6
Germany, West	8.3	8.8	13.2	18.1	17.3	22.8	27.3	16.5	17.0	12.7	12.1	20.9
Greece	.2	.6	.2	.9	1.4	6	.3	.7	.1	.2	(a)	.1
Ireland	.3	.7	.2	1.4	1.1	2.5	3.0	1.9	1.8	3.1	1.5	.9
Italy	8.9	5.8	9.1	6.6	11.1	9.7	10.1	6.5	8.7	6.0	8.9	6.7
Netherlands	1.9	1.0	2.5	2.9	3.9	5.0	1.5	1.3	1.2	.7	1.7	2.4
Norway	2.2	1.5	3.9	1.0	1.8	.9	.7	.4	.1	.7	.3	.3
Poland	4.4	4.5	3.9	19.4	2.7	2.1	(a)	.2	1.5	.5	.9	.4
Portugal	.1	.1	.1	.2	.2	.3	1.6	.1	(a)	.1	.2	(a)
Romania	.3	1.4	4.8	20.9	1.3	2.3	1.4	1.2	(a)	0	0	0
Spain	19.1	3.6	2.6	2.0	3.3	3.1	8.2	4.0	1.4	1.1	3.0	2.0
Sweden	7.6	11.6	9.1	5.7	3.2	7.5	3.5	2.2	1.5	3.6	3.2	2.9
Switzerland	3.2	2.3	2.4	3.7	5.3	8.9	7.8	5.4	5.2	2.0	2.6	4.9
United Kingdom	21.0	21.6	13.3	27.2	67.4	42.8	46.7	49.3	29.5	30.6	19.9	35.8
U.S.S.R.	67.6	31.8	23.0	15.5	4.6	23.6	15.1	1.2	7.4	.6	.4	1.0
Yugoslavia	1.1	.8	.7	3.4	2.4	1.1	1.8	.5	.6	.7	.3	1.1
All Other	.3	(a)	.6	.3	.4	1.3	.9	.4	.1	.8	2.3	1.6
NORTH AND CENTRAL AMERICA	69.0	74.6	60.6	71.1	108.1	205.1	401.8	137.5	60.8	79.6	91.7	109.0
Canada	45.0	39.6	34.7	44.7	60.4	116.2	208.0	57.6	33.8	45.4	49.3	43.6
Mexico	21.3	33.4	23.5	23.0	44.8	86.2	190.8	78.0	24.6	31.4	40.3	53.8
All Other	2.2	1.5	2.1	2.8	2.9	2.7	3.0	1.9	2.4	2.8	2.1	1.7
SOUTH AMERICA	38.2	47.1	41.9	44.1	37.9	33.0	33.2	33.8	12.1	26.0	30.1	21.8
Argentina	2.6	2.1	2.0	6.6	3.7	6.5	4.3	6.0	1.1	2.0	1.1	.8
Brazil	29.9	34.9	28.0	25.5	18.5	14.6	14.7	16.2	8.0	17.4	20.9	14.3
Chile	.4	1.0	.6	.4	.6	.9	1.3	.6	.2	1.6	.1	.7
Colombia	1.0	.3	1.4	1.3	1.4	3.2	2.1	2.5	.9	2.3	2.2	1.5
Ecuador	.4	.9	.6	1.3	1.3	.7	1.7	.5	.1	.5	.1	.3
Peru	.6	.5	.4	.2	.5	.6	.6	.8	(a)	.3	.3	.6
Venezuela	3.2	7.2	8.6	8.6	11.5	5.9	7.9	7.0	1.6	1.8	5.5	3.6
All Other	.1	.2	.3	.3	.3	.6	.6	.1	.1	.2	(a)	0

Footnotes at the end of Table. (Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1975 to Date

(Millions of Dollars)
(Continued)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
ASIA	$51.5	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9	$100.4	$92.7	$66.4	$91.5	$127.3
China	(a)	(a)	(a)	4.6	8.8	3.9	1.3	2.0	13.1	10.1	21.7	34.8
Hong Kong	.3	.5	.5	1.8	1.3	.9	1.8	1.5	1.6	2.3	3.1	1.9
India	2.0	1.9	2.3	4.1	3.4	7.0	10.4	11.7	4.2	2.8	4.4	7.7
Iran	1.8	1.8	3.3	7.2	.3	0	(a)	.6	(a)	(a)	.1	(a)
Israel	3.7	2.5	3.1	3.0	6.3	4.3	5.3	4.0	3.0	2.8	3.6	2.4
Japan	23.6	15.6	12.1	30.9	31.1	38.6	40.8	36.6	30.1	23.8	20.1	35.8
Korea, Republic of	1.8	4.3	5.6	22.1	24.2	16.4	12.7	9.0	6.0	6.7	9.8	19.2
Philippines	5.0	1.1	.5	1.0	1.6	1.6	1.9	4.0	1.5	.1	.6	.3
Saudi Arabia	(a)	(a)	(a)	3.9	7.4	4.7	8.0	8.3	9.0	2.6	2.1	.4
Singapore	2.0	1.5	2.2	4.6	5.2	3.8	10.4	11.6	6.3	2.3	7.4	5.1
Taiwan	4.2	4.9	5.0	6.1	6.9	6.5	6.5	7.3	7.8	4.2	3.8	4.1
Turkey	1.4	.5	.5	4.5	1.5	.3	.9	.7	2.6	5.0	5.2	10.4
All Other	5.6	7.5	7.9	2.7	2.5	2.8	5.8	3.2	7.5	3.7	9.6	5.4
OCEANIA	15.4	4.8	3.7	6.3	9.8	5.5	15.9	6.7	4.0	2.2	4.5	4.2
Australia	15.2	4.2	3.2	5.8	8.6	4.9	15.3	6.1	3.2	2.0	4.0	3.9
New Zealand	.2	.6	.5	.4	1.2	.5	.3	.6	.6	.2	.5	.2
All Other	(a)	(a)	(a)	(a)	(a)	(a)	.3	.1	.1	(a)	0	.1
AFRICA	7.4	5.8	4.8	4.8	6.9	10.8	13.5	12.8	4.2	4.5	3.4	1.5
Egypt	.1	.2	.6	.4	.7	1.8	3.2	2.4	.7	2.0	1.4	.3
Rep. of South Africa	5.6	3.8	3.1	3.4	4.7	7.8	8.5	7.8	2.8	1.5	.9	.6
All Other	1.8	1.8	1.1	.9	1.5	1.2	1.8	2.8	.8	1.1	1.0	.6

(a) Less than $50,000 and/or included in "All Other."

NOTE: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS
By Country of Destination, 1975 to Date
(Millions of Dollars)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GRAND TOTAL	$224.5	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6	$211.5	$147.7	$159.1	$166.5	$219.1
EUROPE	80.7	78.7	60.1	57.7	67.6	78.1	78.2	51.4	44.3	38.6	36.8	53.8
Austria	.4	.3	.5	.1	.1	.4	.1	.2	.4	.1	(a)	.7
Belgium	4.5	2.2	2.3	3.2	1.8	2.9	3.2	.8	.7	1.0	.9	2.6
Denmark	.6	.2	.7	.8	1.8	1.7	.8	.6	.3	.5	.2	.2
Finland	.5	.8	.7	(a)	.1	.1	.5	3.9	.8	.3	.1	.3
France	7.4	7.2	5.8	4.7	9.3	10.6	10.0	5.3	7.4	7.5	3.1	6.1
Germany, West	5.5	7.2	10.5	11.6	11.1	10.9	7.9	5.3	13.9	8.8	10.9	16.1
Greece	1.5	.5	.4	.3	3.1	.6	1.1	.9	.3	.1	.2	(a)
Ireland	1.8	.7	.8	.6	1.8	1.1	8.5	2.3	2.7	.8	.7	1.2
Italy	2.7	8.0	4.4	4.4	6.4	3.7	6.7	8.5	6.8	.8	2.3	10.1
Netherlands	2.5	2.6	1.9	1.9	1.5	2.8	5.9	2.0	1.5	1.4	1.2	1.1
Norway	.6	.2	.3	.5	.5	1.0	.3	.2	.2	.2	.4	.5
Poland	3.5	9.0	4.3	4.8	.4	(a)	0	(a)	.5	.1	.2	.3
Portugal	.2	.6	(a)	.2	.2	.2	.5	(a)	(a)	.2	(a)	.2
Romania	1.6	.2	(a)	.1	5.3	1.0	.1	2.1	0	0	0	0
Spain	9.0	2.2	1.7	1.8	1.3	10.4	6.0	2.3	.6	1.4	.7	1.2
Sweden	1.5	1.5	1.1	1.1	.8	3.4	2.0	2.9	1.1	.6	.4	2.9
Switzerland	.9	.5	.8	.6	.9	3.6	1.4	1.7	.2	3.3	1.0	1.5
United Kingdom	13.8	16.7	13.4	19.2	16.3	20.2	17.3	10.5	5.6	10.2	11.3	7.5
U.S.S.R.	21.4	16.3	8.4	1.2	2.7	2.2	1.4	.1	(a)	.1	.7	.2
Yugoslavia	.4	1.5	.9	.1	1.3	1.0	3.1	.6	(a)	.2	.2	.5
All Other	.2	.2	1.1	.3	1.0	.1	1.4	1.5	1.3	1.2	2.2	.7
NORTH AND CENTRAL AMERICA	54.7	62.1	48.8	48.7	59.8	99.4	118.8	84.1	47.3	52.9	57.4	72.1
Canada	31.6	39.3	26.4	31.8	34.9	46.2	48.2	24.7	28.0	37.2	32.7	41.4
Mexico	19.1	19.5	18.5	13.9	22.9	49.5	68.1	57.9	17.9	14.4	23.5	30.1
All Other	2.9	2.6	3.0	2.6	2.0	3.7	2.5	1.5	1.4	1.4	1.2	.6
SOUTH AMERICA	39.7	69.5	31.9	31.2	51.7	31.6	28.8	17.7	6.3	7.6	7.1	7.4
Argentina	1.4	2.2	1.2	4.3	4.3	7.3	3.4	2.2	.8	1.7	.1	.4
Brazil	25.4	51.6	12.5	5.7	5.3	4.7	9.5	4.8	3.0	1.1	3.8	2.3
Chile	.2	.3	.5	.8	1.7	1.4	.9	1.4	(a)	.2	(a)	1.0
Colombia	1.2	1.0	3.4	1.8	2.6	2.4	2.5	.9	.8	.9	1.6	.3
Ecuador	.5	.6	1.9	1.2	2.6	.9	2.2	.8	.3	.1	(a)	.1
Peru	1.5	1.6	.6	.1	1.2	1.6	2.9	.1	.1	.1	.1	.5
Venezuela	9.2	12.0	11.6	16.9	33.7	13.0	7.2	7.3	1.3	3.5	1.5	2.9
All Other	.3	.2	.2	.4	.3	.3	.2	.2	(a)	.1	(a)	(a)

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1975 to Date

(Millions of Dollars)
(Continued)

Destination	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
ASIA	$38.3	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7	$41.1	$38.9	$49.6	$46.5	$79.3
China	(a)	(a)	(a)	1.4	.5	2.8	.2	.4	3.6	2.8	4.9	15.7
Hong Kong	.2	.2	.7	.5	.3	3.0	8.4	1.0	.6	.8	1.3	.3
India	.9	.5	1.9	2.8	1.0	2.7	4.8	3.7	1.1	3.6	2.2	2.2
Iran	4.5	10.3	6.4	13.7	1.6	0	(a)	.4	0	.5	.9	.1
Israel	2.0	1.4	.7	1.1	4.6	8.1	2.4	2.8	4.0	5.4	1.9	2.6
Japan	15.0	11.4	9.9	8.1	17.1	20.5	13.4	14.4	5.6	15.6	16.1	16.4
Korea, Republic of	3.2	.8	1.3	2.0	9.9	7.9	2.3	2.3	2.8	1.6	5.1	12.2
Philippines	1.4	.7	1.0	.4	1.0	1.7	1.3	1.2	.6	1.1	.6	.3
Saudi Arabia	(a)	(a)	(a)	5.2	7.8	6.3	6.9	9.0	12.8	9.4	.9	8.8
Singapore	.9	1.6	1.7	.8	1.1	1.6	3.3	3.1	2.9	2.8	5.0	3.0
Taiwan	3.4	4.2	12.1	3.5	3.2	8.8	9.7	.8	1.4	.9	2.8	7.6
Turkey	1.3	.5	.1	.4	(a)	.1	.5	.5	.8	1.7	1.6	8.1
All Other	13.2	5.4	8.7	2.9	3.1	4.4	4.4	1.6	2.8	3.2	3.4	2.1
OCEANIA	6.1	3.6	4.1	7.5	7.2	6.7	6.7	5.9	5.1	5.5	10.9	4.7
Australia	5.7	3.3	3.4	7.1	6.8	5.8	6.2	5.0	4.7	5.3	10.6	4.3
New Zealand	.4	.2	.5	.3	.4	.8	.4	.9	.4	.1	.3	.4
All Other	(a)	.1	.1	.1	(a)	(a)	.1	.1	0	(a)	(a)	0
AFRICA	5.0	5.8	5.0	5.8	3.3	6.3	13.4	11.2	5.8	4.9	7.8	1.8
Egypt	.1	.2	.6	.6	.2	.8	3.1	1.5	1.5	2.1	1.3	.4
Rep. of South Africa	3.5	3.9	1.8	2.9	.9	4.0	8.3	2.7	2.7	2.3	3.7	.8
All Other	1.4	1.7	2.6	2.3	2.2	1.6	2.0	7.0	1.7	.5	2.8	.5

(a) Less than $50,000 and/or included in "All Other."

Note: Indiviual items may not add to totals due to rounding. Figures include used machine tools for all years but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Machine Classification, 1975 to 1984
(Millions of Dollars)

Machine Classification	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$417.2	$362.7	$321.4	$453.7	$544.9	$674.6	$974.2	$630.5	$430.8	$446.0
Complete New Machines	327.9	273.8	247.2	353.0	392.5	462.8	668.6	375.6	230.6	223.5
Machining Centers, N.C.										
Vertical, A.T.C.	27.4	35.5	35.9	13.1	14.1	9.3	11.4	6.1	3.3	3.2
Horizontal, A.T.C.				18.2	28.5	24.3	27.0	19.1	4.2	10.5
Other				2.2	2.8	23.2	15.0	8.8	5.8	4.9
Vertical Boring-Drilling-Milling	(a)	(a)	(a)	.9	.9	8.2	42.1	4.6	6.1	4.8
Horizontal Boring-Drilling-Milling	8.4	5.8	11.4	9.1	14.4	5.8	12.9	8.9	2.9	4.5
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	7.7	8.1	6.6	6.6	10.6	13.6	18.7	14.5	5.7	5.9
Boring-Drilling-Milling, N.E.C.	3.7	2.4	2.2	5.0	6.5	5.5	5.7	4.4	3.9	2.4
Drilling, Vertical (Upright)	6.4	4.9	4.6	2.5	2.0	1.4	2.9	.8	2.5	.1
Multiple Spindle	1.8	1.3	1.6	3.3	3.6	11.5	7.8	3.6	.7	4.9
Radial	.9	1.6	1.1	1.6	1.3	1.9	2.0	1.3	1.2	.2
Other	4.7	5.8	7.4	6.4	9.9	7.5	11.7	6.7	4.0	5.1
Gear Hobbers and Shapers (b)	1.8	1.6	.4	1.3	2.1	8.8	22.7	5.3	1.6	3.0
Gear Tooth Grinding & Finishing	5.9	7.9	3.8	12.8	4.4	14.0	18.1	9.2	3.3	5.3
Other Gear Cutting (g)	23.7	16.2	23.9	32.9	37.3	38.4	39.3	22.7	7.0	9.0
External Cylindrical Grinding	9.6	11.1	3.7	34.0	13.2	9.3	15.9	7.2	3.9	3.9
Surface Grinding	8.6	10.8	8.3	8.8	11.4	16.8	26.2	17.4	12.6	9.8
Tool and Cutter Grinding	7.9	7.1	7.3	6.8	5.7	9.2	9.5	6.5	5.1	2.8
Polishing and Buffing	1.3	1.0	.9	2.7	2.9	5.2	11.2	8.1	3.6	10.1
Honing and Lapping	4.1	7.0	3.3	4.3	3.8	3.9	9.5	3.3	2.9	2.4
Internal Cylindrical Grinding	6.3	6.9	3.7	4.9	5.9	7.8	5.1	4.3	1.4	1.7
Other Grinding and Polishing (c)	15.2	13.4	12.9	19.3	23.1	32.7	49.0	24.3	19.6	16.0
Engine Lathes	6.8	6.1	4.3	8.3	6.1	3.0	5.6	2.4	3.5	2.7
Turret Lathes (Excl. Vertical)	4.6	9.4	6.7	7.1	7.0	(f)	(f)	(f)	(f)	(f)
Automatic Chucking Lathes										
Single Spindle	9.9	7.6	4.2	7.7	12.4	5.6	7.5	2.3	2.7	3.0
Multiple Spindle	2.8	2.8	4.6	3.4	4.9	3.6	4.3	2.3	1.0	4.8
Automatic Screw Machines	7.4	6.2	5.7	5.2	6.3	9.8	10.9	4.6	3.2	4.5
Other Lathes	12.1	15.3	16.8	11.9	16.3	45.1	61.8	58.8	24.5	24.5
Milling Machines										
Knee Type	4.7	3.2	4.5	4.0	3.4	1.1	.5	.8	1.5	.2
Bed Type	1.8	1.7	2.9	11.9	2.8	2.8	2.0	.3	.1	.3
Profile, Dup. & Die Sinking	2.9	3.4	1.0	5.5	4.9	2.9	5.5	1.6	1.5	.3
Other	11.2	6.0	12.9	9.1	12.3	12.4	29.8	19.6	10.8	21.9
Broaching	5.5	1.8	3.4	11.6	2.4	6.9	15.5	13.3	1.4	1.1
Planers, Other than Gear	.5	.6	.7	1.5	1.6	(a)	(a)	(a)	(a)	(a)
Shapers and Slotters	.5	1.0	.6							
Sawing and Cutoff	9.0	8.5	7.0	13.5	12.5	12.2	12.6	8.8	9.1	9.6
Tapping	1.4	3.4	1.6	1.9	1.9	(a)	(a)	(a)	(a)	(a)
Threading	3.0	2.5	4.5	4.2	9.9	(a)	(a)	(a)	(a)	(a)
Electrical Discharge	(a)	(a)	(a)	3.4	5.2	10.2	5.2	3.2	5.8	3.6
Single Station (Way Type)	(a)	(a)	(a)	.3	.4	51.7	97.2	36.4	21.1	5.2
Multi-Station	72.0	25.1	7.7	16.0	42.9					
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (d)	17.3	11.9	10.8	11.7	14.5	21.1	27.1	20.1	13.2	21.9
Less than $2,500, New (e)	9.0	8.9	8.3	17.9	20.5	15.9	19.0	13.7	10.3	9.5
Used and Rebuilt Machines	15.2	16.0	10.5	13.5	15.5	32.6	55.4	27.9	27.7	26.7
Parts	74.1	72.9	63.7	87.3	136.9	179.2	250.2	226.9	172.5	195.8

N.E.C. - Not Elsewhere Classified.

(a) Included in "Metal Cutting Machine Tools, N.E.C."
(b) "Gear Hobbers" for years prior to 1978.
(c) "Other Grinding" for years prior to 1978.
(d) "$1,000 and Over" for years prior to 1978.
(e) "Less than $1,000" for years prior to 1978.
(f) Included in "Other Lathes."
(g) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Machine Classification, 1975 to 1984

(Millions of Dollars)

Machine Classification	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$288.6	$320.0	$258.1	$284.9	$333.7	$424.6	$471.4	$371.9	$261.1	$289.0
Complete New Machines	208.7	241.1	179.5	180.1	226.6	271.4	281.0	198.9	128.4	150.0
Punching and Shearing Machines	13.8	20.2	15.4	13.7	22.3	44.8	44.9	32.9	18.1	22.6
Bending and Forming Machines	22.9	26.0	25.5	39.2	45.7	41.0	46.0	35.1	19.7	19.4
Hydraulic and Pneumatic Presses	37.5	46.8	29.1	21.5	32.6	42.0	56.4	29.9	19.6	16.7
Mechanical Presses, O.B.I.	28.5	33.2	17.5	2.2	1.1	27.7	22.9	23.9	10.4	19.3
Other Mechanical Presses				8.6	18.1					
Headers and Upsetters	8.7	10.6	9.2	14.8	13.2	4.4	7.7	7.2	3.7	7.5
Forging Machines (except Presses)	3.8	3.0	4.2	6.2	7.0	12.0	13.6	8.1	4.2	4.2
Metal Container – making Machines	17.0	23.6	12.0	22.8	32.9	(c)	(c)	(c)	(c)	(c)
Metal Forming Machines, N.E.C.	9.3	6.5	8.1	44.7	46.5	92.4(d)	83.1(d)	57.6(d)	49.1(d)	57.2(d)
Metalworking Machines, N.E.C., $2,500 and over (a)	63.6	67.0	54.2							
Metal Forming Mach. Tools under $2,500 (b)	3.6	4.2	4.3	6.4	7.2	7.1	6.1	4.2	3.7	2.9
Used and Rebuilt Machines	15.8	15.6	14.9	13.6	14.2	18.6	22.6	12.5	19.2	9.1
Parts	64.1	63.3	63.7	91.2	92.9	134.7	167.8	160.5	113.4	129.9

N.E.C. – Not Elsewhere Classified.

(a) "$1,000 and over" for years prior to 1978.
(b) "under $1,000" for years prior to 1978.
(c) Included in "Metal Forming Machines, N.E.C."
(d) From 1980 forward "Die Casting Machines & Parts" are included.

Sources: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1985 and 1986

(Value in Thousands of Dollars)

Machine Classification	1985		1986	
	Units	Value	Units	Value
GRAND TOTAL	36,359	$494,646(a)	44,998	$564,906(a)
Complete New Machines	32,729	$242,479	41,553	$335,150
Gear Hobbers and Shapers	20	3,370	91	8,131
Gear Cutting Machines, N.E.C.	48	13,669	90	20,841
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	20	1,407	16	1,589
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	7	2,598	8	3,810
Horizontal Machining Centers, ATC, NC	29	8,041	27	7,637
Machining Centers, NC, N.E.C.	100	8,956	80	7,455
Single Station and Multi-Station Transfer Machines	9	2,505	47	37,400
Way Type Machines (Unit Heads)	6	1,844	2	75
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	16	5,397	11	4,471
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	0	0	2	164
Vertical Boring-Drilling-Milling Machines, NC	10	4,393	49	2,588
Horiz. Boring-Drilling-Milling Machines, non-NC	21	2,062	11	1,287
Vertical Boring-Drilling-Milling Machines, non-NC	30	974	36	3,395
Drilling Machines, NC	18	2,357	19	2,013
Drilling Machines, Multi-Spindle, non-NC	24	1,762	48	8,569
Drilling Machines, Radial, non-NC	54	463	27	498
Drilling Machines, Upright, Single Spindle, non-NC	11	298	13	234
Drilling Machines, non-NC, N.E.C.	90	2,011	173	4,091
Milling Machines, NC	11	5,308	33	9,710
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	49	851	59	4,665
Milling Machines, Knee Type, non-NC	5	118	8	511
Milling Machines, Bed Type, non-NC	16	7,812	16	3,261
Milling Machines, non-NC, N.E.C.	252	5,212	111	7,055
Vertical Boring Machines, incl. VTL's, NC	19	1,971	15	5,814
Vertical Boring Machines, incl. VTL's, non-NC	62	2,500	346	21,939
Boring Machines, NC, N.E.C.	[illegible]	731	6	1,728
Boring Machines, non-NC, N.E.C.	83	5,296	83	4,769
Horizontal Lathes, Multi-Spindle, NC	NA	NA	7	897
Horizontal Lathes, excl. Multi-Spindle, NC, Less Than 25 HP	100(b)	7,523(b)	130	9,829
Horizontal Lathes, excl. Multi-Spindle, NC, 25-50 HP	23(b)	3,089(b)	22	3,278
Horizontal Lathes, excl. Multi-Spindle, NC, Over 50 HP	15(b)	4,677(b)	9	1,489
Horizontal Engine & Toolroom Lathes, non-NC	142	2,167	53	1,154
Automatic Chucking Lathes, Single Spindle, non-NC	9	540	11	1,878
Automatic Chucking Lathes, Multi-Spindle, non-NC	20	1,205	14	620
Automatic Bar Machines, Single Spindle, non-NC	18	690	28	1,066
Automatic Bar Machines, Multi-Spindle, non-NC	26	1,854	24	1,214
Horizontal Lathes, non-NC, N.E.C.	346	6,792	1,426	21,775
Vertical Lathes, Multi-Spindle, excl. VTL's, NC	88	10,417	13	3,582
Vertical Lathes, excl. Multi-Spindle & VTL's, NC			31	3,275
Vertical Lathes, excl. VTL's, non-NC	243	13,043	146	8,911
Grinding, Polishing, Honing & Lapping Machines, NC	51	7,838	86	10,409
Gear Tooth Grinding & Finishing Machines, non-NC	37	3,402	54	6,650
Tool & Cutter Grinding Machines, non-NC	150	8,449	170	5,306
Honing & Lapping Machines, non-NC	211	3,363	243	8,822
Grinding Machines, Flat Surface Reciprocating Table, non-NC	86	2,032	58	1,415
Grinding Machines, Flat Surface, non-NC, N.E.C.	275	10,622	194	15,281
External Grinding Machines, non-NC	44	5,124	28	2,981
Internal Grinding Machines, non-NC	10	1,961	11	2,190
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	137	8,950	160	8,097
Grinding Machines, non-NC, N.E.C.	401	8,250	214	5,863

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1985 and 1986
(Value in Thousands of Dollars)
(Continued)

Machine Classification	1985 Units	1985 Value	1986 Units	1986 Value
Traveling Wire Electrical Discharge Machines	1	$ 90	8	$ 447
All Other Electrical Discharge Machines	117	5,008	97	2,025
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	6	185	15	1,511
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	41	1,711	35	1,120
Metal Cutting Machine Tools, NC, N.E.C.	44	2,781	19	1,213
Sawing & Cut-off Machines, non-NC	490	10,643	438	8,435
Broaching Machines, non-NC	14	1,025	10	592
Metal Cutting Machine Tools, non-NC, N.E.C.	270	7,427	188	7,026
Metal Cutting Machine Tools, Less Than $2,500	28,298	9,648	36,169	13,023
Metal Cutting Machine Tools, Used or Rebuilt	3,621	43,449	3,445	36,115
Parts	—	208,718	—	193,641

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.
(b) Data includes both Single Spindle & Multi-Spindle machines.

Source: U.S. Bureau of the Census "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1985 and 1986
(Value in Thousands of Dollars)

Machine Classification	1985 Units	1985 Value	1986 Units	1986 Value
GRAND TOTAL	9,354	$277,607(a)	8,088	$343,203(a)
Complete New Machines	8,792	$157,974	7,150	$211,460
Die Casting Machines & Parts	—	13,642	—	18.351
Metal Forming Machine Tools, Less Than $2,500	5,621	3,535	4,106	2,764
Punching & Shearing Machines, incl. Combination, NC	44	4,092	40	4,415
Shearing Machines, non-NC	45	4,023	64	1,464
Punching & Combination Punching & Shearing Mach., non-NC	507	10,024	466	15,966
Bending, Folding, Straightening & Flattening Machines, NC	124	9,337	119	5,961
Press Brakes, non-NC	28	577	96	4,154
Bending Rolls, Ram & Press Bending Machines, non-NC	14	462	19	1,357
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	532	19,948	473	22,424
Mechanical Presses, non-NC	207	15,810	165	14,843
Hydraulic Presses, Vertical, Single Action, non-NC	34	2,779	47	8,704
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	723	23,062	703	39,917
Headers & Upsetters, non-NC	61	8,279	70	11,487
Forging Machines, non-NC, N.E.C.	122	3,942	94	8,169
Metal Forming Machine Tools, non-NC, N.E.C.	730	38,427	688	51,450
Metal Forming Machine Tools, Used or Rebuilt	562	8,533	938	7,599
Parts	—	111,100	—	124,144

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census "EM 522."

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1958 to Date

(Millions of Dollars)

Year	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1958	$ 148.8	$100.5	$ 48.3	$ 28.1	$ 17.6	$ 10.5
1959	135.0	82.2	52.8	32.5	23.8	8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	220.6	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981	1,445.6	974.2	471.4	1,712.9	1,485.1	227.8
1982	1,002.4	630.5	371.9	1,489.4	1,258.1	231.3
1983	691.9	430.8	261.1	1,100.2	836.9	263.3
1984	734.9	446.0	289.0	1,652.7	1,316.5	336.1
1985	772.2	494.6	277.6	2,110.1	1,685.6	424.5
1986	908.1	564.9	343.2	2,682.9	2,015.3	667.6

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146."

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES
INCLUDING VERTICAL TURRET LATHES
1967 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1967	435	$13.0	177	$4.8	937	$21.0
1968	383	14.4	147	4.4	1,057	19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,083	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981	797	79.4	NA	41.5E	3,158	86.7
1982	303	32.4	NA	14.9	3,140	78.8
1983	193	18.5	NA	D	1,327	44.6
1984	266	17.6	NA	D	844	49.7
1985	247	23.3	NA	D	972	50.4
1986	559	46.2	NA	D	1,240	119.6

NA - Not Available. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

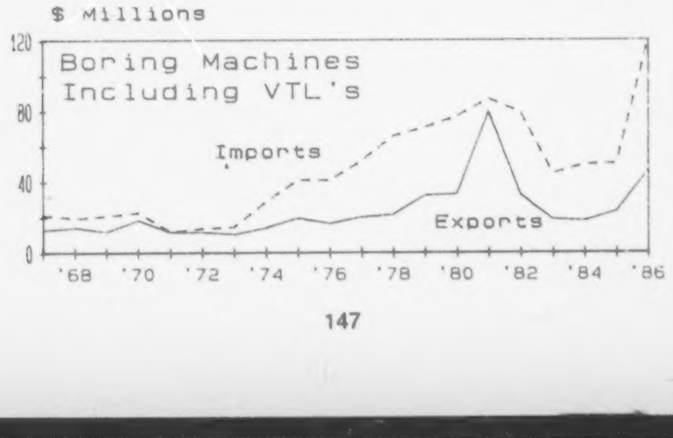
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments exclude vertical turret lathes.

(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

The user should be aware that the minimum valuation of machines included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES

1967 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1967	3,427	$10.9	685	$ 7.2	5,304	$ 7.6
1968	1,811	6.8	724	4.7	5,403	10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980	546	22.2	NA	12.2	2,253	27.2
1981	566	24.4	NA	12.1	2,238	26.4
1982	349	12.4	NA	3.4	1,317	20.7
1983	233	8.3	NA	5.1	585	9.9
1984	222	10.3	NA	1.2	916	17.9
1985(r)	197	6.9	NA	3.0	1,314	32.6
1986(p)	290	15.4	NA	1.0	1,266	39.1

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

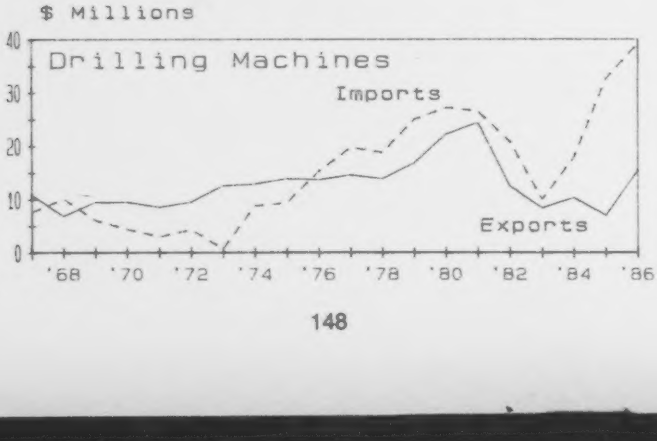
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufactures' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES

1967 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1967	852	$23.6	692	$29.4	279	$ 3.6
1968	1,266	26.6	647	30.8	297	3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684(e)	43.8(e)	NA	D	466	33.1
1980	519(e)	61.2(e)	NA	D	415	41.3
1981	698(e)	80.1(e)	NA	D	367	37.0
1982	369(e)	37.4(e)	NA	D	281	25.8
1983	65	11.8	NA	D	153	13.8
1984	84	17.3	NA	D	328	18.1
1985	105	20.4	NA	D	301	20.5
1986	235	35.6	NA	D	557	32.6

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

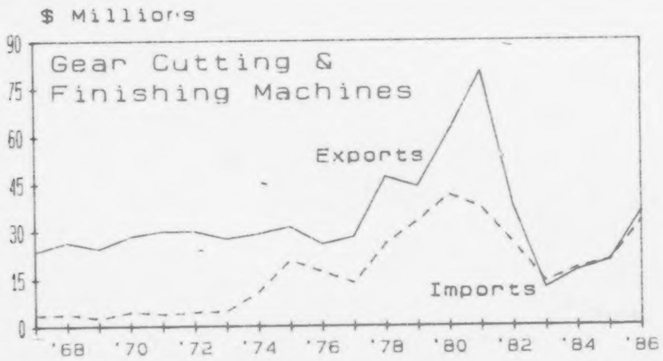
(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

(e) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES

1967 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1967	7,128	$ 32.0	4,155	$29.7	4,934	$ 16.0
1968	7,679	28.9	3,354	27.7	5,792	17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	48.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2(d)
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980	1,979	85.1	NA	75.4	5,698	138.6
1981	2,694	126.5	NA	88.2	5,334	137.2
1982	1,877	71.1	NA	69.3	4,530	117.6
1983	930	49.0	NA	54.2	3,282	89.6
1984	999	46.7	NA	34.1	5,249	118.5
1985(r)	1,365	56.6	NA	36.8	6,746	147.9
1986(p)	1,164	60.4	NA	45.5	6,611	190.0

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

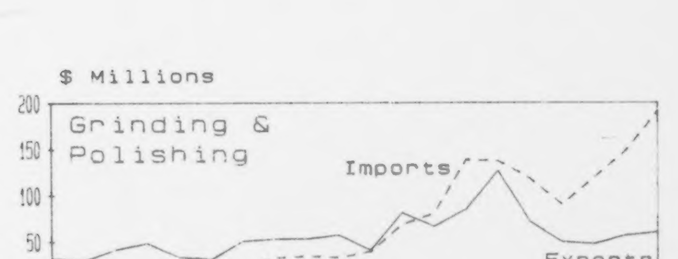
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31,000.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN LATHES
EXCLUDING VERTICAL TURRET LATHES
1967 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1967	2,611	$21.6	1,083	$18.7	15,654	$ 47.7
1968	2,161	18.8	683	15.3	11,452	38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,301	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5(d)	18,332	353.6
1980	1,107	67.1	NA	50.8(d)	16,710	380.0
1981	1,468	90.0	NA	58.5(d)	15,445	479.8
1982	957	70.4	NA	36.8	11,141	338.6
1983	687	34.9	NA	D	6,662	165.7
1984	904	39.4	NA	D	9,019	268.1
1985	1,030	52.0	NA	D	11,938	350.3
1986	1,929	59.0	NA	D	11,767	391.1

NA-Not Available. E-Estimate by NMTBA. D-Withheld to avoid disclosre.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

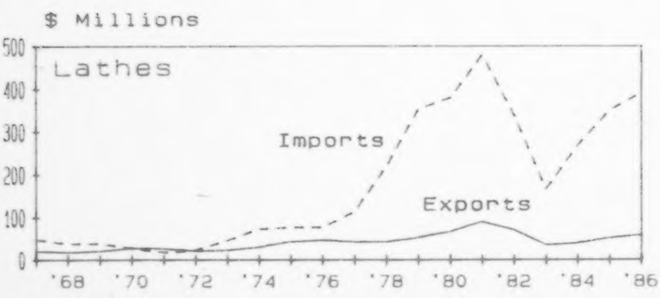
(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(d) Does not include data for Vertical NC Lathes.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MILLING MACHINES

1967 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1967	802	$11.3	399	$16.8	5,715	$ 31.4
1968	848	17.9	304	12.1	5,428	30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981	292	37.8	NA	33.4	10,434	124.7
1982	331	22.4	NA	21.0	5,985	87.7
1983	187	13.9	NA	9.0	3,660	52.5
1984	209	22.7	NA	16.1	6,471	83.4
1985	333	19.3	NA	26.8	7,736	133.7
1986(p)	227	25.2	NA	D	6,551	113.8

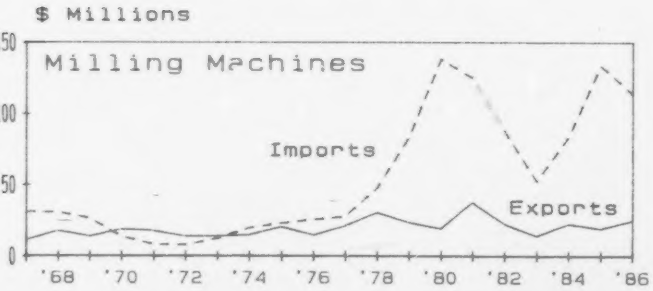
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MACHINING CENTERS

1979 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980	313	56.7	NA	$57.9	957	93.4
1981	316	53.4	NA	43.0	2,007	195.7
1982	195	34.0	NA	D	1,873	188.9
1983	102	13.3	NA	D	1,936	164.9
1984	117	18.6	NA	10.2	2,911	248.0
1985(r)	156	21.0	NA	D	4,188	330.0
1986(p)	131	20.5	NA	20.4	4,037	361.8

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS (c,d)

1962 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1962	5,704	$ 32.4	2,667	$ 31.8	5,669	$ 4.4
1963	9,636	25.4	3,382	16.7	4,849	5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,434	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,728	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980	53,943	150.6	NA	173.2	582,050	169.7
1981	70,191	232.1	NA	168.7	901,398	204.5
1982	48,525	123.4	NA	49.2(e)	1,174,244	199.2
1983	38,895	108.4	NA	23.2(e)	1,753,390	175.7
1984(r)	40,538	77.6	NA	12.8(e)	1,331,381	252.8
1985(r)	32,917	86.3	NA	17.0(e)	1,035,677	309.3
1986(p)	40,473	109.0	NA	10.3(e)	872,862	406.5

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other". After 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

(e) Does not include data for Station Type Machines.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS

1967 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
Year	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New(b)	Used	Parts	Customs Import Value (a)
1967	$ 94.9	$22.5	$13.6	$ 6.4	$ 6.6	$ 20.5	$ 5.0	$ 20.3	$ 28.9
1968	107.8	33.9	10.2	5.9	5.5	25.4	3.6	23.3	25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	29.2
1970	135.1	25.9	11.0	6.5	6.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	11.3	9.4	10.6	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.1	46.6	25.6	15.4	13.4	78.5	14.9	63.7	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.6	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.6	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8
1982	371.9	53.8	35.1	32.9	15.3	61.7	12.5	160.5	231.3
1983	261.1	30.0	19.7	18.1	7.9	52.8	19.2	113.4	263.3
1984	289.0	36.0	19.4	22.6	11.8	60.1	9.1	129.9	336.1
1985	277.5	41.7	30.3	18.1	12.2	55.6	8.5	111.1	424.5
1986	343.2	63.4	33.9	21.8	19.7	72.6	7.6	124.1	667.6

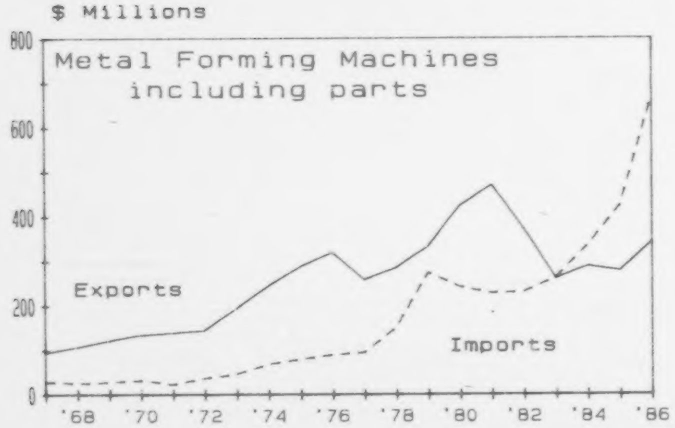
(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(b) Beginning in 1980 "Die Casting Machines" are included.

Individual items may not add to totals due to rounding.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
Year	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1959	2,166	$ 31.3	714	$15.1	793	$ 4.1	226	$ 3.0	96	$ 5.3	337	$ 3.8
1960	2,716	47.3	893	23.3	913	5.6	307	5.1	173	9.0	430	4.2
1961	2,758	55.2	934	30.7	930	4.7	283	6.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981	NA	156.7	NA	43.1	NA	29.8	NA	29.5	NA	D	NA	D
1982	NA	118.4	NA	36.6	NA	19.6	NA	16.2	NA	D	NA	D
1983	NA	54.3	NA	13.6	NA	13.9	NA	9.8	NA	D	NA	D
1984	NA	62.7	NA	15.2	NA	14.4	NA	6.8	NA	D	NA	D
1985(r)	NA	77.6	NA	15.4	NA	15.8	NA	20.5	NA	8.5	NA	17.4
1986(p)	NA	66.8E	NA	13.2	NA	22.0	NA	13.0	NA	5.8E	NA	12.8

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: first, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1959 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1959	9,867	$ 80.8	7,701	$ 49.5	2,166	$ 31.3
1960	13,203	157.5	10,487	110.2	2,716	47.3
1961	14,080	207.2	11,322	152.0	2,758	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10,037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,780	57.7
1972	12,093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980	NA	630.8	NA	482.3	NA	148.5
1981	NA	675.0	NA	518.3	NA	156.7
1982	NA	427.5	NA	309.1	NA	118.4
1983	NA	212.3	NA	158.0	NA	54.3
1984(r)	NA	178.7	NA	115.9	NA	62.7
1985(r)	NA	269.8	NA	192.2	NA	77.6
1986(p)	NA	265.8	NA	199.1	NA	66.8E

NA - Not Available. p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b, factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Note: See note on page 156.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1970 to 1978

(Values in Thousands of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978
METAL CUTTING									
Boring									
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Precision Boring	$ 1,918	$2,089	D	$ 1,036	$ 5,565	$ 4,755	$ 1,973	$ 644	$ 1,260
Gear Cutting									
Gear Hobbers	431	8,749	D	10,988	9,914	9,802	5,076	6,808	9,501
Gear Tooth Finishing	9,176								
Grinding									
External Cylindrical									
Plain	2,816	7,688	$8,535	8,394	15,046	17,796	2,710	14,786	2,844
Roll and Centerless	3,416						19,665		12,205
All Other	10,064								
Surface Grinding	5,175	2,280	D	5,422	5,235	7,426	5,096	6,801	7,829
Special Tool & Cutter Grinding	2,553	2,854	1,996	920	D	3,897	5,897	15,779	4,856
Honing	1,694	1,015	D	1,559	2,077				
Lathes									
Manufacturing and Tool Room (Up to 36")	1,089	1,900	1,789	1,959	4,111	4,985	5,430	3,143	2,010
Automatic Chucking									
Single Spindle	1,487	1,558	1,660	1,518	2,742	8,514	5,744	4,817	10,181
Multiple Spindle	9,502	7,159	3,173	5,229	4,203	4,882	5,493	3,193	
Screw (bar) Machines	7,165	6,637	6,194	6,693	7,474	10,707	7,974	7,813	2,451
Milling									
Profile and Duplicator	5,074	3,062	1,643	2,499	1,645	2,992	D	D	2,325
Broaching	3,096	1,711	541	3,165	2,142	5,891	3,052	D	8,368
Sawing and Cut-off Machines	NA	NA	4,121	4,541	3,402	10,351	6,541	3,399	8,056
Transfer Machines	18,807	6,533	9,755	39,494	31,240	93,541	34,406	12,423	27,988
METAL FORMING									
Power Shearing									
Plate	2,322	765	1,554	2,699	3,303	8,023	7,942	7,944	5,044
Rotary								143	191
Bending and Forming, Power									
Bending Rolls, Sheet & Plate	800	1,799	2,313	2,348	9,194	3,592	3,413	3,936	2,727
Bending Brakes and Folders	1,025								
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mechanical Presses									
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)									
Single Action, Single Point, 201 Tons and Over	940	2,256	2,766	1,256	D	5,452	D	D	D
Single Action, Two Point, 500 Tons and Under (a)	1,327								
Hydraulic and Pneumatic Extrusion Presses	7,120	2,194	D	1,905	D	D	D	D	D

NA - Not Available. D - Withheld to avoid disclosure.

(a) Beginning in 1973: Single Action, Two Point, 300 Tons and Under.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL CUTTING MACHINE TOOLS

1979 to Date

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982	1983	1984(r)	1985(r)	1986(p)
METAL CUTTING MACHINE TOOLS	$283.5	$482.3	$518.3	$309.1	$158.0	$115.9	$192.2	$199.1
Boring Machines	9.5	17.7	D	14.9	D	3.5	3.4	D
Drilling Machines	4.2	12.2	12.1	3.4	5.1	1.2	3.0	1.0
Valued under $2,500	.3	.2	.2	D	D	D	D	D
All other Drilling Machines	3.9	12.0	12.0	D	D	D	D	D
Gear Cutting Machines	D	D	D	D	D	D	D	D
Grinding, Polishing, Buffing, Honing & Lapping Machines	42.0	75.4	88.2	69.3	54.2	34.1	36.8	45.5
Valued under $2,500	.7	.6	.6	.4	.4	.7	.6	9.6
External Cylindrical Grinding								
Plain (incl. angular wheel type) & Universal	6.3	D	10.4	10.3	D	10.6		
Roll, Centerless, & Chuck type grinders	D	D	30.4	26.4	21.5		6.3	
All other External types	5.7	D						
Internal Cylindrical Grinding Surface Grinding Machines:								
Rotary & Reciprocating table type	5.4	10.3	10.3	9.2	D	17.9	7.4	11.6
All other Surface Grinders	D	2.0	36.5		2.7			
All other Grinding Machines	D	15.3		5.3	5.0		16.3	16.4
Honing & Lapping Machines	5.6	18.3		17.6	14.9	5.0	6.1	7.8
Polishing & Buffing Machines								
Horizontal NC Turning Machines	16.9	21.6	21.2	17.2	D	10.8	14.1	12.7
Vertical NC Turning Machines	D	D	D	2.5	D	0	D	D
Non-NC Turning Machines	28.7	29.2	37.3	17.1	9.9	5.0	11.0	13.3
Valued under $2,500	1.4	1.5	D	D	D			
Engine or Tool Room lathes, swing over cross slide	D	D	3.1	2.2	D			
Turret lathes, horizontal	D	D	6.4					
Automatic lathes				D	D			
Single Spindle	D	D						
Multiple Spindle	10.5	14.7	26.3	D	D			
All other Horizontal lathes	D	D	D	4.6	D			
All other Vertical lathes								
Milling Machines	20.1	27.9	33.4	21.0	9.0	16.1	26.8	D
Machining Centers	D	57.9	43.0	D	D	10.2	D	20.4
Drill, Mill, Bore, manual tool change	D	D	D	D	D	D	D	D
Drill, Mill, Bore, (ATC) Vertical	12.3	18.4	15.0	D	D	4.5	5.0	5.1
Horizontal	33.7	36.2	24.4	19.3	D	D	12.4	D
All other Machining Centers	D	D	D	D	D	0	D	0
Station Type Machines	47.4	133.9	111.0	D	D	D	D	D
Other Metal Cutting Machines	26.6	39.3	57.8	49.2	23.2	12.8	17.0	10.3

D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS

1981 to Date

(Values in Millions of Dollars)

Machine Classification	1981	1982	1983	1984	1985(r)	1986(p)
METAL FORMING MACHINE TOOLS	$156.7	$118.4	$54.3	$62.7	$77.6	$66.8E
Punching, Shearing, Bending and Forming Machines	59.3	35.7	23.7	21.2	36.3	35.0
Punching & Shearing valued under $2,500	.6	.3	.2	.3	.3	.3
Punches, incl. combination Punching & Shearing Machines	19.6	3.2	8.2	4.8	20.2	12.7
Punching Machines fixed position and two axes positioning table		7.0				
Plate Shearing Machines	9.3	5.7	1.3	1.7		
Other Punching & Shearing						
All Bending & Forming valued under $2,500	.9	.7	.4	.4	.8	.7
Press Brakes						
Bending Rolls						
Rotary Bending & Forming Machines (incl. Rotary Head)	16.6	8.7	6.1	13.9	6.8	21.3
Ram & Press Bending Machines						
Other Bending & Forming	12.3	10.2	7.4		8.2	
Presses, except forgings	43.1	36.6	13.6	15.2	15.4	13.2
Presses valued under $2,500	.2	.4	.3	D		
Mechanical Presses:						
Open Back Inclinable	3.8	D	D	D	7.0	10.9
Other Mechanical Presses	25.0	15.4	5.8	D	8.4	2.3
Hydraulic Presses	14.3	D	D	D		
Forging Machines	D	D	D	D	8.5E	5.8E
Other Metal Forming Machines	D	D	D	D	17.4	12.8
Thread Rolling	D	D	D	D		1.1
Metal Container Making Machinery	NA	10.3(a)	7.5(a)	6.6(a)	7.3	5.1
Die Casting	D	D	D	D	D	8.4
Riveting Machines	D	D	D	D	D	
Other Metal Forming Machines	19.4	7.7	4.4	8.3	10.0	

NA - Not Available. D - Withheld to avoid disclosure. r - Revised. p - Preliminary. E - Estimated by NMTBA.

(a) "Metal Container Making Machinery" was included with "Other Metal Forming Machines" prior to 1982.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

6

WORLD MACHINE TOOL INDUSTRY

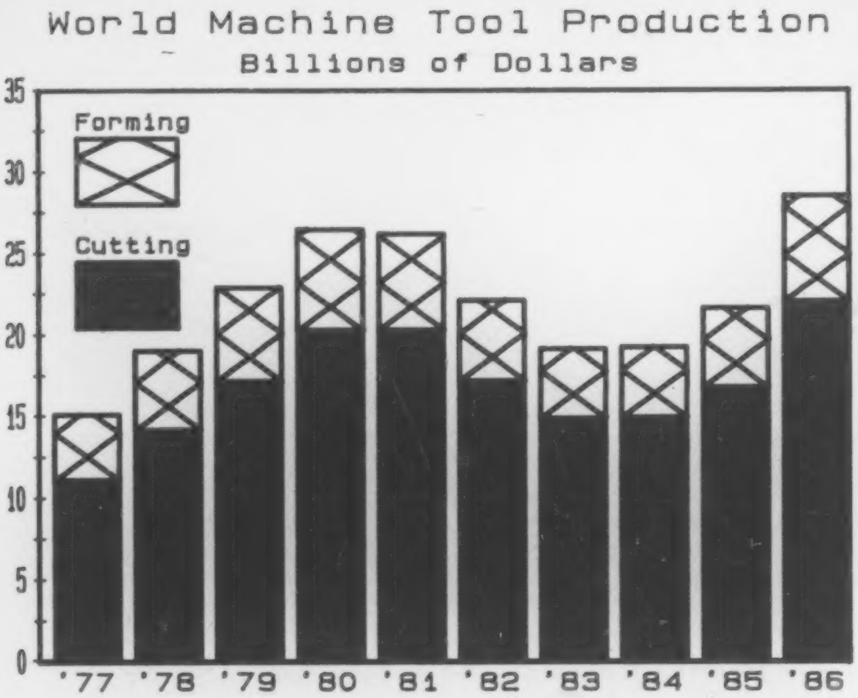
As is the case with many other manufactured products, the machine tool market has rapidly become internationalized over the course of the past fifteen years. During the 1960's the majority of the world's machine tools came from the U.S. and western Europe. This is no longer the case as Japan has become a formidable global competition and many developing nations are developing their domestic machine tool industries. Therefore, in order to accurately reflect the state of the machine tool industry and market in the U.S. it is necessary to put it into a global context. The statistics in this chapter are intended to do this. Using a wide variety of information, obtained primarily from foreign governments and trade associations, this chapter contains a comprehensive review of world-wide machine tool production, exports and imports.

For many years American Machinist magazine has been publishing estimates of the world's machine tool production and trade. These estimates, which cover 36 countries, come from unofficial sources and are revised for previous years when "official" figures become available. Whenever possible, data include complete machine tools only and exclude parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

Several years ago, the trade associations of 14 European countries (co-operating through a group called CECIMO) and the United States, Japanese, and Indian trade associations agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1985 are included in this chapter. The machine tool production of the 13 countries reporting in 1985 totaled about $14.8 billion.

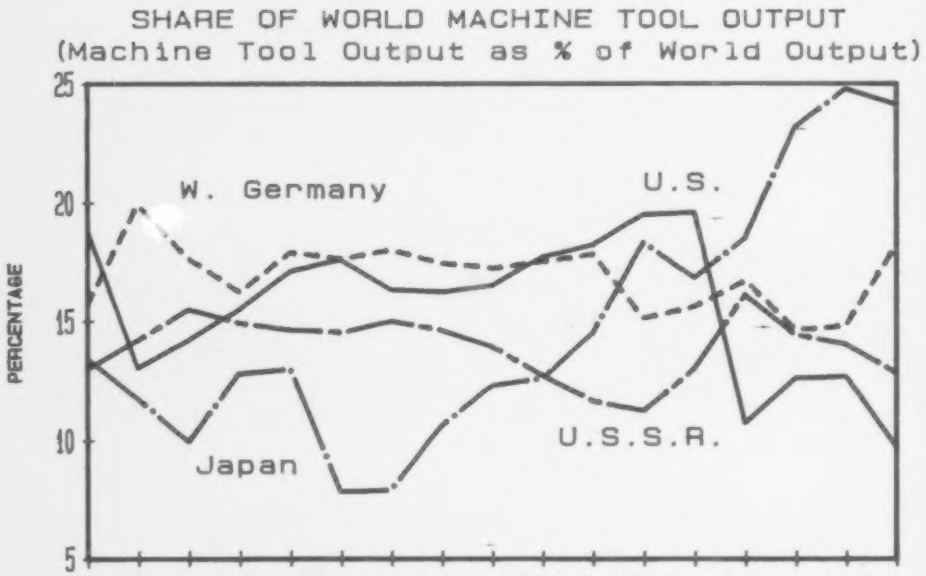
In the uniform international statistical reporting system for CECIMO, each participating country reports its data in Swiss Francs. In this chapter, these data have been converted into dollars with the conversion rates below the tables. These tables can be identified with the source as International Statistics on Machine Tools.

With the "floating" of many world currencies and the dramatic rise and decline of the value of the dollar in recent years, the value measurement of production and trade statistics has become increasingly confusing. Foreign data in this Handbook have been converted into dollars on the basis of the trade conversion factors given in the International Monetary Fund's "International Financial Statistics." It may be useful to convert the dollar-denominated statistics back into national currency when one is attempting to analyse rates of change. The dollar-denominated figures may show declines (increases) whereas national currency figures may reflect healthy gains (declines).



World Machine Tool Production

Billions of Dollars



SHARE OF WORLD MACHINE TOOL OUTPUT

(Machine Tool Output as % of World Output)

WORLD MACHINE TOOL PRODUCTION, 1970 to Date

(Millions of U.S. Dollars) (a)

Years	Total	Metal Cutting	Metal Forming
1970	$ 8,268.2	$ 6,069.2	$2,142.0
1971	8,148.9	5,951.5	2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980	26,501.3	20,268.4	6,232.8
1981	26,209.5	20,274.9	5,934.5
1982	22,071.3	17,171.4	4,957.0
1983	19,147.2	14,862.9	4,284.2
1984	19,250.6	14,912.1	4,338.5
1985(r)	21,480.1	16,735.5	4,744.7
1986(p)	28,519.5	21,988.0	6,531.6

p - Preliminary. r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Sources: McGraw-Hill, Inc. "American Machinist," Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

LEADING MACHINE TOOL CONSUMING NATIONS (a)

1986 and 1985

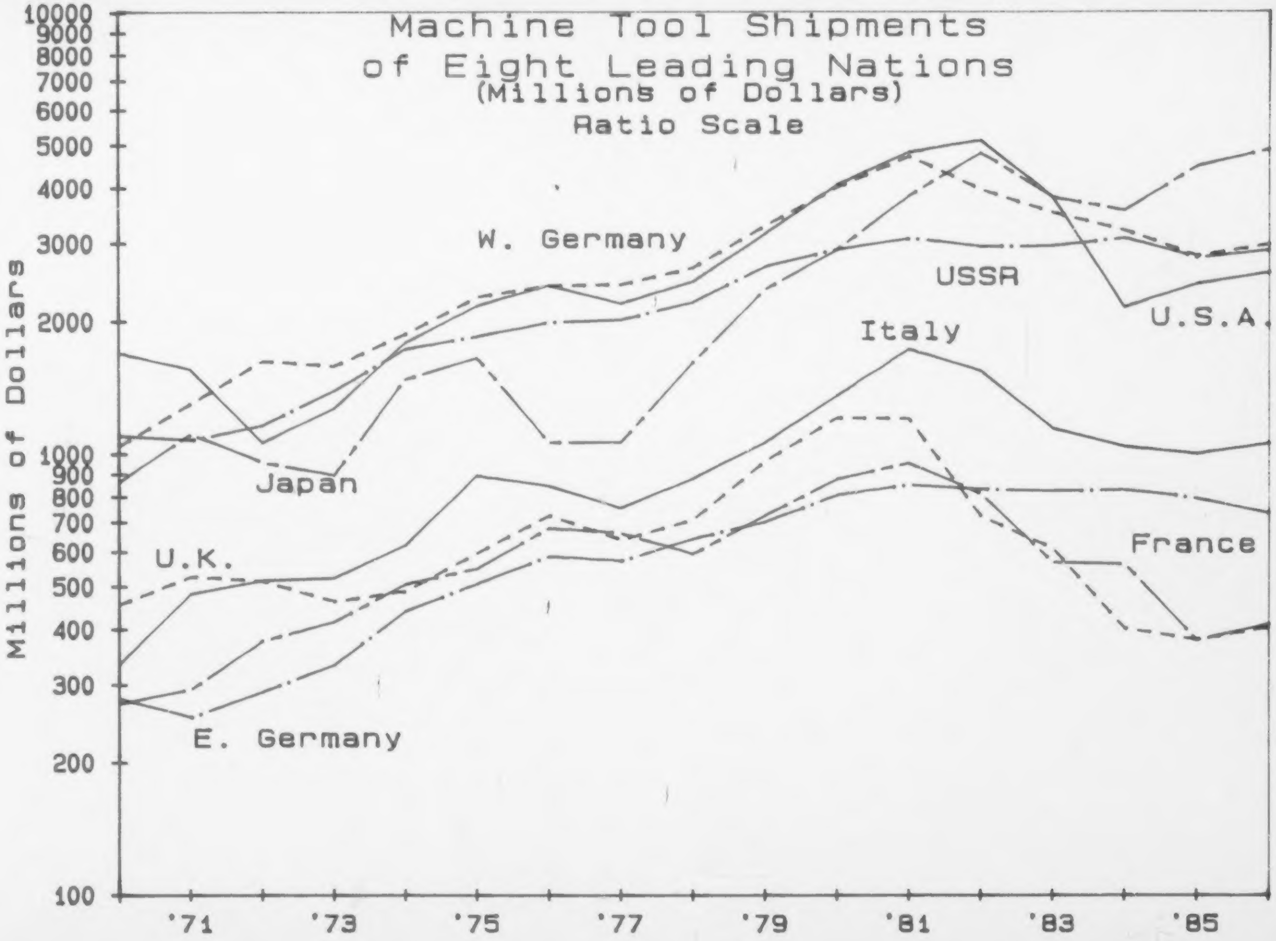
(Millions of U.S. Dollars)

Country	1986	1985	Percent Change (b)	
			U.S. Dollars	Nat'l Currency
1. U.S.S.R.	$5,071.8	$4,213.0	20.4%	7.2%
2. United States	4,441.4	4,003.9	10.9	10.9
3. Japan	4,091.4	3,356.6	21.9	-13.9
4. FRG (West Germany)	3,325.8	1,947.9	70.7	25.9
5. Italy	1,001.7	604.5	65.7	29.4
6. France	898.0	593.6	51.3	16.6
7. United Kingdom	705.1	481.9	46.3	29.3
8. South Korea	532.5	385.6	38.1	39.9
9. Switzerland	492.3	155.8	216.0	131.3
10. PRC (China)	478.7	549.5	-12.9	2.4
11. Canada	418.3	428.0	-2.3	-0.5
12. Brazil	379.3	276.3	37.3	202.4
13. Romania	325.8	344.0	-5.3	-10.7
14. Spain	323.4	160.3	101.7	66.2
15. Sweden	291.3	179.0	62.7	34.7
16. India	287.0	305.4	-6.0	-4.2
17. Yugoslavia	243.0	165.4	46.9	106.2
18. Mexico	216.0	161.0	34.2	219.5
19. Bulgaria	213.4	197.6	8.0	8.0
20. Australia	211.3	137.9	53.2	60.1
21. Belgium	196.8	128.8	55.2	16.8
22. Taiwan	192.8	152.1	26.8	19.1
23. Austria	189.3	102.2	85.2	36.7
24. Hungary	185.0	128.4	44.1	31.8

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ for some countries. These percent change values are not influenced by currency conversion rates and, therefore, more realistically reflect changes in machine tool consumption.

Sources: McGraw-Hill, Inc., "American Machinist," International Statistics on Machine Tools and NMTBA.


Machine Tool Shipments
of Eight Leading Nations
(Millions of Dollars)
Ratio Scale
Millions of Dollars
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
900
800
700
600
500
400
300
200
100
'71
'73
'75
'77
'79
'81
'83
'85
W. Germany
USSR
U.S.A.
Italy
Japan
France
U.K.
E. Germany

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1986 (ESTIMATED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 6,877.5	$ 5,342.1	$1,535.4	$ 3,063.4	$ 277.3
2. FRG (West Germany)	5,185.4	3,743.7	1,441.7	2,880.9	1,021.3
3. Soviet Union*	3,657.1	2,943.4	713.8	252.5(b)	1,667.2(b)
4. United States	2,779.9	1,999.4	780.5	590.3	2,251.8
5. Italy	1,624.6	1,147.2(a)	477.5(a)	969.7	346.8
6. Switzerland	1,439.0	1,269.2	169.8	1,259.9	313.2
7. GDR (East Germany)*	1,294.7	1,064.3	230.4	1,345.2	184.3
8. France	588.1	471.3	116.8	308.1	618.0
9. United Kingdom	533.7	444.5	89.2	377.5	548.9
10. Spain	396.3	312.4	83.9	178.7	105.8
11. Czechoslovakia*	383.0	340.8	42.2	310.3	80.7
12. Taiwan	371.8	340.3(a)	31.5(a)	264.9	85.9
13. Brazil	370.0(b)	280.0(b)	90.0(b)	38.7	48.0
14. PRC (China)*	363.7(b)	303.1(b)	60.6(b)	8.3(b)	123.3(b)
15. Yugoslavia	321.4	203.5	117.9	198.6	120.2
16. Romania*	307.0(b)	283.4(b)	23.6(b)	52.0(b)	70.8(b)
17. S. Korea	241.6	207.1	34.5	24.7	315.6
18. Sweden	226.6	146.6	80.1	164.6	229.3
19. Hungary*	225.0	180.0	45.0	139.2	99.2
20. Canada	209.5	144.3	65.2	156.8	365.6
21. India	153.8	129.9	23.9	33.4	166.6
22. Austria	156.2	121.4	34.8	140.2	173.3
23. Poland*	153.5(b)	133.6(b)	20.0(b)	69.3(b)	84.2(b)
24. Belgium	143.5	31.5	112.0	211.7	265.0
25. Bulgaria*	143.2	132.1	11.0	86.3	156.5
26. Israel	100.0	100.0	0.0	85.0	60.0(b)
27. Denmark	66.8	47.0	19.8	56.9	147.2
28. Netherlands	65.4	38.8	26.6	114.0	225.2
29. Australia	38.8(b,c)	25.4(b,c)	13.4(b,c)	5.5(c)	178.0(c)
30. Singapore	34.4(b)	31.3(b)	3.1(b)	84.5(b)	144.7(b)
31. Finland	24.5(b)	3.6(b)	20.9(b)	17.9	96.3
32. Mexico	18.0(b)	15.0(b)	3.0(b)	1.0(c)	199.0(b)
33. Portugal	14.1	5.6	8.4	8.4	26.8
34. South Africa	10.1	6.2	3.9	0.6	140.0
35. Hong Kong	1.3(b)	0.1(b)	1.2(b)	6.1	74.2
Total	28,519.5	21,988.0	6,531.8	13,505.1	11,010.2

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.

(b) Rough estimate from fragmentary data.

(c) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union, Bulgaria, Czechoslovakia and Poland at 70% of the official rate; GDR at 65% of the FRG rate; Hungary, PRC (China), and Romania at IMF commercial rates.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1986 have been converted at International Monetary Fund rates for the first nine months of 1986 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1986 average rates.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Sources: McGraw-Hill, Inc., "American Machinist," International Statistics on Machine Tools, and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1985 (revised)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 5,316.6	$ 4,406.4	$ 910.2	$2,179.0	$ 219.0
2. FRG (West Germany)	3,168.4	2,238.3	930.2	1,806.6	586.1
3. Soviet Union*	3,035.8	2,433.3	602.4	210.2	1,387.4
4. United States	2,717.8	1,888.3	829.5	452.4	1,738.5
5. Italy	1,115.5	811.8	303.8	707.4	196.4
6. Switzerland	822.1	723.2	98.9	836.3	170.0
7. GDR (East Germany)*	730.4	600.4	130.0	758.9	96.3
8. France	444.7	353.8	90.9	208.6	357.5
9. United Kingdom	417.8	338.2	79.6	322.0	386.1
10. PRC (China)	341.2(a)	284.3(a)	56.9(a)	14.4(a)	222.7(a)
11. Czechoslovakia*	338.1	296.5	41.6	252.9	67.2
12. Romania*	324.1	299.2	24.9	54.9	74.8
13. Taiwan	278.2	252.4	25.8	201.7	75.6
14. Brazil	265.0(a)	198.0(a)	67.0(a)	28.0	39.3
15. Spain	252.9	206.1	46.8	151.5	58.9
16. Yugoslavia	239.2	153.1	86.1	142.7	68.9
17. Canada	199.0	140.5	58.4	104.9	333.9
18. S. Korea	180.4	146.2	34.2	23.4	228.6
19. Hungary*	175.5	140.4	35.1	138.0	90.9
20. India	165.9	140.1	25.8	22.2	161.7
21. Sweden	161.4	101.1	60.3	139.4	157.0
22. Poland*	148.1(a)	128.8(a)	19.3(a)	71.2	86.5
23. Bulgaria*	132.6	122.4	10.2	79.9	144.9
24. Israel	96.0	96.0	0.0	82.9	56.7
25. Belgium	93.4	23.2	70.2	132.6	166.0
26. Austria	79.6	53.3	26.3	93.9	116.5
27. Denmark	53.3	37.8	15.6	42.0	74.9
28. Netherlands	37.6	24.7	12.9	68.8	135.6
29. Australia	36.4(a,b)	24.5(a,b)	11.9(a,b)	7.0(a,b)	108.5(a,b)
30. Singapore	34.1	31.0	3.1	83.6	143.2
31. South Africa	28.5	19.7	8.8	1.1	365.9
32. Finland	20.0(a)	2.9(a)	17.1(a)	22.8	70.1
33. Mexico	18.0(a)	15.0(a)	3.0(a)	3.0(a)	146.0(a)
34. Portugal	11.2	4.5	6.7	6.7	22.9
35. Hong Kong	1.3(a)	0.1(a)	1.2(a)	5.7	51.6
Total	21,480.1	16,735.5	4,744.7	9,456.6	8,406.1

(a) Rough estimate from fragmentary data.
(b) Year ended June 30.

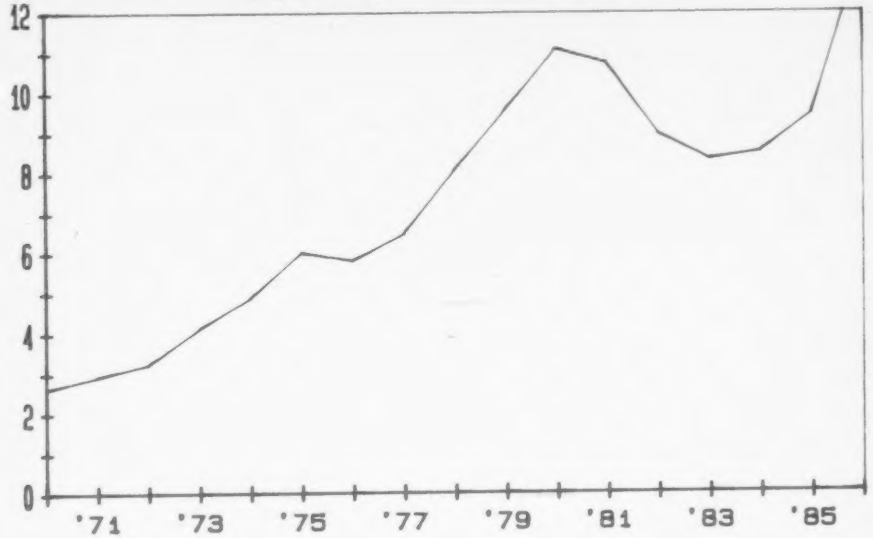
* - Countries with controlled currencies. The Soviet Union, Bulgaria, Czechoslovakia and Poland at 70% of the official rate; GDR at 65% of the FRG rate; Hungary, PRC (China) and Romania at IMF commercial rates.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1985 have been converted at International Monetary Fund rates for the first nine months of 1985 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1985 average rates.

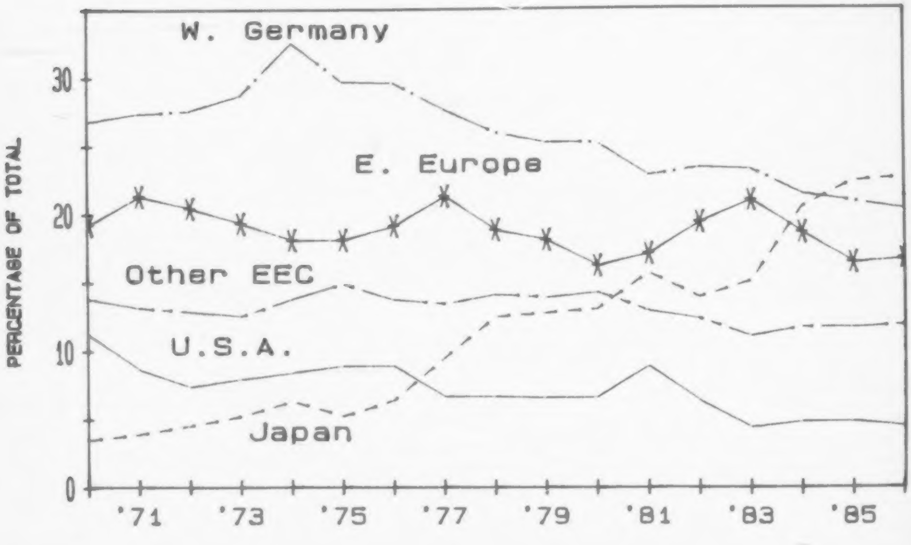
Notes: Whenever possible, data include machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: McGraw-Hill, Inc., "American Machinist" and NMTBA.

World Exports of Machine Tools
Billions of Dollars



Share of World Exports
(Machine Tool Exports as a % of World)



PRODUCTION, EXPORTS AND IMPORTS OF COMPLETE MACHINE TOOLS

Selected Countries, 1983 to 1985

(Millions of U.S. Dollars)

	Production			Exports			Imports		
Country	1983	1984	1985	1983	1984	1985	1983	1984	1985
Austria	$ 94.8	$ 120.9	$ 79.6	$ 127.3	$ 131.8	$ 93.9	$104.9	$ 90.4	$ 116.5
Belgium	82.1	77.1	93.4	96.6	104.2	132.6	114.8	126.8	166.0
Denmark	39.0	36.3	NA	39.8	33.4	NA	42.1	56.9	NA
France	560.0	465.5	499.3	295.2	250.1	208.5	351.1	301.2	357.5
India	184.0	180.5	165.9	21.5	13.6	22.2	148.5	141.6	NA
Italy	1,037.0	996.0(a)	1,115.6(a)	592.6	557.8(a)	707.6(a)	181.7	182.7(a)	196.4(a)
Japan	3,541.1	4,473.3	5,316.7	1,263.6	1,751.5	2,179.0	171.3	181.4	219.0
Netherlands	29.3	34.4	37.6	56.0	56.2	69.7	73.6	107.5	137.7
Portugal	12.7E	10.2E	NA	2.4E	4.8E	NA	23.1E	19.1E	NA
Spain	193.1	211.5	253.2	99.4	113.3	151.5	86.3	56.1	58.9
Sweden	156.6	157.9	163.3	114.5	124.9	139.4	129.5	127.8	157.0
Switzerland	673.6	653.3	822.1	583.6	577.9	715.9	101.0	130.2	170.1
United Kingdom	398.8	376.9	430.4	319.0	302.4	373.3	294.3	342.4	451.1
United States	2,132.7	2,412.0	2,638.0	359.1	373.0	388.0	921.1	1,319.0	1,689.0
West Germany	3,193.5	2,803.7	3,168.2	1,950.4	1,781.9	1,930.4	452.7	467.0	612.8

NA - Not Available. E - Estimate.

Data does not include polishing, honing or lapping machines.

Note: Exchange rates used to convert the national currencies into U.S. dollars are the annual averages for 1985 published in the International Monetery Fund's "International Financial Statistics," (monthly).

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comite European de Cooperation des Industries de la Machine Tool); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA (National Machine Tool Builders' Association).

PRODUCTION, EXPORTS AND IMPORTS OF COMPLETE MACHINE TOOLS
Selected Countries, 1985
(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Austria	$ 79.6	$ 53.3	$ 26.3	$ 93.9	$ 64.8	$29.1	$ 116.5	$ 70.6	$45.7
Belgium	93.4	23.2	70.2	132.6	76.6	55.9	166.0	133.6	32.2
Denmark	NA	NA	NA	NA	NA	NA	NA	NA	NA
France	499.3	387.5	111.9	208.5	125.3	83.1	357.5	261.1	96.4
India	165.9	140.2	25.8	22.2	21.8	0.2	NA	NA	NA
Italy	1,115.6(a)	811.9(a)	303.8	707.6(a)	469.3(a)	238.3	196.4(a)	154.6(a)	41.9
Japan	5,316.7	4,406.5	910.2	2,179.0	1,655.8	523.1	219.0	147.6	71.5
Netherlands	37.6	24.7	12.9	69.7	35.7	34.0	137.7	86.0	51.9
Portugal	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	253.2	206.5	46.8	151.5	116.7	34.8	58.9	37.2	21.7
Sweden	163.3	100.5	62.8	139.4	78.8	60.5	157.0	118.2	38.9
Switzerland	822.1	723.2	98.9	715.9	641.4	74.5	170.1	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA	NA
United States	2,638.0	1,901.0	737.0	388.0	243.0	145.0	1,689.0	1,332.0	357.0
West Germany	3,168.2	2,238.3	929.7	1,930.4	1,233.1	697.3	612.8	438.9	174.0

NA - Not Available.

(a) Data does not include polishing, honing or lapping machines.

Note: Individual items may not add to Total due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF COMPLETE METAL CUTTING MACHINE TOOLS

Selected Countries, 1985

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 53.3	$ 6.6	(a)	(b)	$ 4.9	$ 12.9	$ 10.2	$ 18.7
Belgium	23.2	NA	NA	NA	NA	NA	NA	NA
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	387.5	7.5	$ 6.0	(b)	20.3	78.1	58.9	216.7
India	140.2	9.1	8.0	$ 3.1	17.8	54.6	17.8	29.8
Italy	811.9(c)	38.2	18.9	15.2	63.4(c)	125.2	96.4	454.6
Japan	4,406.5	105.3	64.5	65.6	566.1	1,114.7	308.5	2,181.8
Netherlands	24.7(d)	NA	NA	NA	NA	NA	NA	24.7
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	206.5	9.8	11.5	NA	19.8	47.6	70.0	47.8
Sweden	100.5	(b)	10.7	(b)	43.0	27.3	16.7	2.8
Switzerland	723.2	NA	j67	NA	NA	NA	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA
United States	1,901.0	84.0	39.0	52.0	413.0	318.0	180.0	815.0
West Germany	2,238.3	80.5	60.1	106.3	408.3	521.7	355.6	705.8

NA - Not Available.

(a) Data included in "Boring Machines."
(b) Data included in "Other Metal Cutting."
(c) Data does not include polishing, honing or lapping machines.
(d) Data includes parts.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF COMPLETE METAL FORMING MACHINE TOOLS

Selected Countries, 1985

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 26.3	$ 6.2	$ 6.4	$ 13.7
Belgium	70.2	NA	NA	NA
Denmark	NA	NA	NA	NA
France	111.9	13.4	40.6	57.9
India	25.8	3.3	16.0	6.5
Italy	303.8	31.4	86.9	185.4
Japan	910.2	82.1	698.8	129.3
Netherlands	12.9	NA	1.6	11.3
Portugal	NA	NA	NA	NA
Spain	46.8	11.1	17.5	18.1
Sweden	62.8	11.6	16.9	34.3
Switzerland	98.9	NA	NA	NA
United Kingdom	NA	NA	NA	NA
United States	737.0	162.0(a)	254.0	321.0(a)
West Germany	929.7	197.4	333.2	399.1

NA - Not Available.

(a) Data for bending and forming machines included in "Punching & Shearing."

Source: International Statistics on Machine Tools.

IMPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS
Selected Countries, 1985
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 70.6	$ 7.6	(a)	$ 0.1	$ 15.1	$ 20.7	$ 13.8	$ 13.3
Belgium	133.6	4.2	$ 5.7	0.7	12.3	19.1	14.1	77.5
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	261.1	19.5	13.5	3.6	46.7	72.2	32.6	73.0
India	NA	NA	NA	NA	NA	NA	NA	NA
Italy	154.6(b)	7.9	5.2	3.7	24.6(b)	34.6	19.4	59.2
Japan	147.6	3.0	2.0	14.1	73.0	16.4	10.8	28.3
Netherlands	86.0	4.8	6.1	0.7	12.8	23.6	18.2	19.8
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	37.2	1.6	1.0	0.4	12.3	8.6	3.8	9.5
Sweden	118.2	0.0	7.1	2.7	17.3	30.3	20.6	40.2
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA
United States	1,332.0	43.0(c)	33.0(c)	21.0(c)	148.0(c)	358.0(c)	133.0(c)	596.0
West Germany	438.9	29.2	29.6	6.8	84.6	112.1	73.7	102.9

NA – Not Available.

(a) Included in "Boring Machines."
(b) Data does not include Polishing, Honing, or Lapping Machines.
(c) Data for machines valued less than $2,500 is included in "Other Metal Cutting."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF COMPLETE METAL FORMING MACHINE TOOLS
Selected Countries, 1985
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 45.7	$ 7.9	$ 9.3	$ 28.5
Belgium	32.2	8.9	5.1	18.2
Denmark	NA	NA	NA	NA
France	96.4	25.8	22.4	48.2
India	NA	NA	NA	NA
Italy	41.9	9.4	11.0	21.5
Japan	71.5	7.2	24.2	40.1
Netherlands	51.9	15.5	13.2	23.2
Portugal	NA	NA	NA	NA
Spain	21.7	6.3	4.7	10.7
Sweden	38.9	11.9	9.9	17.1
Switzerland	NA	NA	NA	NA
United Kingdom	NA	NA	NA	NA
United States	357.0	80.0(a,b)	83.0(b)	194.0(a,b)
West Germany	174.0	33.3	35.7	105.0

NA – Not Available.

(a) Data for Bending & Forming machines included in "Punching & Shearing."
(b) Data for machines valued less than $2,500 is included in "Other Metal Forming."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS

Selected Countries, 1985

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 64.8	$ 6.1	(a)	$ 0.1	$ 8.9	$ 31.9	$ 13.2	$ 4.6
Belgium	76.6	0.5	$ 2.5	3.7	3.0	12.6	5.0	49.2
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	125.3	3.0	7.9	1.3	26.8	34.9	28.7	22.7
India	21.8	0.2	0.2	0.2	2.9	7.1	10.9	0.3
Italy	469.3(b)	34.0	27.8	2.1	58.7(b)	75.4	92.7	178.6
Japan	1,655.8	58.6	39.7	8.7	163.2	522.8	96.6	766.2
Netherlands	35.7	6.6	2.4	0.2	13.6	5.1	2.2	5.6
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	116.7	7.6	8.4	0.3	11.2	24.8	49.0	15.4
Sweden	78.8	NA	8.7	0.1	40.1	17.8	9.2	2.9
Switzerland	641.4	NA	NA	NA	NA	NA	NA	641.4
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA
United States	243.0	19.0(c)	7.0(c)	20.0(c)	57.0(c)	57.0(c)	19.0(c)	64.0
West Germany	1,233.1	70.7	35.7	44.8	299.3	309.1	194.6	278.9

NA — Not Available.

(a) Included in "Boring Machines."
(b) Data does not include Polishing, Honing or Lapping machines.
(c) Data for machines valued less than $2,500 is included in "Other Metal Cutting."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF COMPLETE METAL FORMING MACHINE TOOLS

Selected Countries, 1985

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 29.1	$ 3.2	$ 2.9	$ 23.0
Belgium	55.9	14.1	25.4	16.4
Denmark	NA	NA	NA	NA
France	83.1	13.1	13.8	56.2
India	0.2	(c)	0.1	0.2
Italy	238.3	25.7	61.8	150.8
Japan	523.1	83.2	223.2	216.7
Netherlands	34.0	8.0	9.6	16.4
Portugal	NA	NA	NA	NA
Spain	34.8	10.3	10.4	14.1
Sweden	60.5	12.8	24.6	23.1
Switzerland	74.5	NA	NA	NA
United Kingdom	NA	NA	NA	NA
United States	145.0	18.0(a,b)	42.0(b)	85.0(a,b)
West Germany	697.3	120.9	137.9	438.5

NA — Not Available.

(a) Data for bending and forming machines included in "Punching & Shearing."
(b) Data for machines valued less than $2,500 is included in "Other Metal Forming."
(c) Data included in "Other Metal Forming."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1977	$4,855	100.0%	$458	9.4%	$1,772	36.5%	$ 611	12.6%	$498	10.2%	$437	9.0%	$323	6.7%	$269	5.5%	$123	2.5%
1978	6,279	100.0	585	9.3	2,086	33.2	1,017	16.2	659	10.5	598	9.5	426	6.8	383	6.1	139	2.2
1979	7,440	100.0	685	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.3	474	6.4	459	6.2	176	2.4
1980	7,307	100.0	572	7.8	2,211	30.3	1,388	19.0	793	10.9	618	8.5	590	8.1	426	5.8	NA	NA
1981	7,130	100.0	904	13.1	1,924	27.0	1,618	22.7	672	9.4	569	8.0	491	6.9	314	4.4	NA	NA
1982	5,846	100.0	567	9.7	1,679	28.7	1,203	20.6	647	11.1	437	7.5	406	6.9	236	4.0	NA	NA
1983	4,997	100.0	355	7.1	1,440	28.8	1,178	23.6	603	12.1	426	6.5	263	5.3	242	4.8	NA	NA
Industrial Countries																		
United States																		
1977	$ 422	100.0%	—	—	$ 106	25.0%	$ 111	26.4%	$ 35	8.3%	$ 17	4.1%	$ 47	11.0%	$10	2.5%	$ 18	4.2%
1978	678	100.0	—	—	166	24.6	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	25	3.7
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.9	26	2.6	32	3.3
1980	1,196	100.0	—	—	220	18.4	515	43.1	87	7.2	47	3.9	123	10.4	26	2.2	31	2.4
1981	1,373	100.0	—	—	165	12.0	746	54.3	74	5.4	34	2.5	142	10.3	24	1.7	NA	NA
1982	1,094	100.0	—	—	148	13.5	514	47.0	66	6.0	32	2.9	105	9.6	9	.9	NA	NA
1983	799	100.0	—	—	101	12.7	407	50.9	57	7.2	28	3.4	52	6.5	15	1.9	NA	NA
West Germany																		
1977	290	100.0	$ 25	8.5%	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	37	9.6	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.5	71	13.2	32	5.9	48	9.0	18	3.3
1980	612	100.0	27	4.4	—	—	108	17.6	192	31.3	80	13.0	47	7.6	46	7.6	NA	NA
1981	515	100.0	33	6.4	—	—	93	18.1	144	28.0	80	15.6	37	7.1	33	6.5	NA	NA
1982	383	100.0	23	6.1	—	—	54	14.2	135	35.2	49	12.9	21	5.5	24	6.2	NA	NA
1983	348	100.0	28	7.9	—	—	60	17.1	127	36.4	42	12.1	14	4.1	19	5.3	NA	NA

Note: Footnotes on final page of table.

(Continued)

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1977	$256	100.0%	$ 11	4.3%	$135	52.8%	$ 2	.9%	$33	12.9%	$38	14.8%	$17	6.5%	—	—	$ 3	1.1%
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.0	58	17.0	55	16.0	22	6.4	—	—	6	1.6
1980	419	100.0	18	4.2	166	39.5	31	7.3	59	14.1	69	16.4	34	8.0	—	—	—	—
1981	393	100.0	26	6.6	161	41.0	27	6.9	49	12.6	67	17.2	21	5.2	—	—	NA	NA
1982	332	100.0	18	5.5	137	41.4	23	6.8	46	13.7	54	16.2	18	5.5	—	—	NA	NA
1983	330	100.0	12	3.5	155	47.0	15	4.6	42	12.7	63	19.2	18	5.4	—	—	NA	NA
United Kingdom																		
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	$13	6.0%	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	36	10.1	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
1980	426	100.0	52	12.1	150	35.3	69	16.1	43	10.0	39	9.3	—	—	19	4.6	NA	NA
1981	328	100.0	60	18.3	111	33.8	54	16.5	34	10.3	25	7.7	—	—	15	4.5	NA	NA
1982	317	100.0	61	19.3	95	30.1	48	15.0	26	8.3	25	7.8	—	—	15	4.6	NA	NA
1983	224	100.0	35	15.8	74	33.1	43	19.1	20	9.1	14	6.1	—	—	11	4.9	NA	NA
Canada																		
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.2	5	2.9
1980	227	100.0	119	52.6	24	18.4	30	13.0	4	1.7	12	5.4	27	11.9	4	1.8	NA	NA
1981	341	100.0	232	68.1	24	12.0	29	8.4	5	1.4	15	4.5	26	7.7	4	1.2	NA	NA
1982	139	100.0	74	53.0	18	13.5	14	9.8	7	5.1	9	6.2	12	8.6	1	.9	NA	NA
1983	92	100.0	48	52.3	12	12.7	14	15.2	2	2.5	4	4.6	6	6.6	2	2.6	NA	NA
Switzerland																		
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.0
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	8	5.2	12	7.9	3	1.9
1980	192	100.0	12	6.0	103	53.7	12	6.2	—	—	23	12.1	17	9.0	14	7.5	NA	NA
1981	171	100.0	8	4.8	90	52.3	14	8.3	—	—	24	14.0	11	6.2	15	8.8	NA	NA
1982	145	100.0	7	4.9	82	56.7	12	8.0	—	—	17	11.4	8	5.4	11	7.8	NA	NA
1983	102	100.0	6	6.3	54	53.3	9	8.4	—	—	12	11.6	6	6.2	8	7.5	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1977	$ 75	100.0%	$23	30.4%	$ 35	47.4%	—	—	$ 8	10.3%	$ 1	1.8%	$ 1	1.6%	$ 2	3.1%	$1	1.9%
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.2	2	1.3	3	1.8
1980	147	100.0	47	32.0	52	35.7	—	—	33	22.4	3	1.7	4	2.9	2	1.4	NA	NA
1981	151	100.0	49	32.5	49	32.2	—	—	41	27.1	2	1.2	3	2.1	1	2.6	NA	NA
1982	146	100.0	50	33.9	48	33.2	—	—	31	20.9	2	1.3	3	2.0	(c)	1.7	NA	NA
1983	105	100.0	36	34.6	28	27.1	—	—	30	28.8	3	2.4	2	1.8	1	.5	NA	NA
Developing Countries																		
Brazil																		
1977	172	100.0	41	23.7	63	36.8	$ 21	12.1%	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	40	18.8	17	7.9	31	14.7	10	4.8	5	2.3	2	1.0
1979	187	100.0	24	13.0	95	50.6	22	11.9	8	4.4	15	7.8	7	3.8	2	1.2	8	4.3
1980	122	100.0	14	11.4	59	48.4	15	12.4	9	7.4	13	10.4	5	3.9	3	2.4	NA	NA
1981	101	100.0	18	18.1	49	48.6	7	7.3	7	6.8	8	8.3	7	6.6	2	2.1	NA	NA
1982	80	100.0	18	23.0	23	28.1	22	26.8	6	7.6	6	7.4	4	4.7	1	.6	NA	NA
1983	45	100.0	10	21.5	13	27.7	11	24.2	3	6.2	7	14.9	1	2.9	(c)	.2	NA	NA
Republic of Korea																		
1977	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
1978	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	NA	NA	8	2.4	7	2.3	NA	NA
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	.4
1980	133	100.0	20	14.8	19	14.5	83	62.5	4	2.7	1	.7	1	.8	3	1.9	NA	NA
1981	71	100.0	14	19.1	10	14.5	38	53.3	5	6.8	(c)	.3	1	2.0	2	2.7	NA	NA
1982	51	100.0	10	20.1	4	7.6	31	60.5	1	2.2	1	2.4	2	4.8	(c)	.8	NA	NA
1983	125	100.0	7	5.9	8	6.4	102	81.6	2	1.9	2	1.8	(c)	.4	1	.7	NA	NA
Spain																		
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.4	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	.6
1980	74	100.0	5	6.3	25	33.5	3	4.2	5	7.0	11	14.3	8	11.0	14	18.5	NA	NA
1981	169	100.0	14	8.1	107	63.0	15	9.1	4	2.6	15	8.7	4	2.3	8	4.6	NA	NA
1982	86	100.0	5	6.1	45	51.9	6	6.4	4	4.9	10	12.2	4	4.5	9	10.5	NA	NA
1983	61	100.0	2	3.3	26	43.2	3	4.4	4	6.0	8	12.6	2	3.3	14	22.2	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1977	$ 75	100.0%	$ 20	27.1%	$16	21.6%	$ 1	1.4%	$ 3	4.5%	$23	31.0%	$ 3	4.3%	$ 1	1.8%	$1	1.1%
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	3.5	(c)	.5	(c)	.5
1980	44	100.0	12	27.8	12	26.6	1	2.9	1	1.2	14	32.5	1	2.8	1	2.1	(c)	NA
1981	28	100.0	12	43.8	2	8.8	2	7.0	(c)	.6	8	29.3	(c)	1.7	(c)	.5	NA	NA
1982	34	100.0	13	38.0	5	13.5	1	3.7	1	2.2	10	29.6	1	1.7	1	3.4	NA	NA
1983	9	100.0	2	24.5	1	15.2	1	9.3	(c)	.6	4	42.9	(c)	2.1	(c)	3.0	NA	NA
Mexico																		
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.3	4	5.1	4	4.8	1	0.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
1980	207	100.0	89	42.9	49	23.9	17	8.0	7	3.3	10	4.8	14	6.9	5	2.2	NA	NA
1981	360	100.0	225	62.4	37	10.4	18	4.9	6	1.7	23	6.4	11	3.1	15	4.1	NA	NA
1982	277	100.0	112	40.3	34	12.3	64	23.0	4	1.3	6	2.1	22	7.9	6	2.3	NA	NA
1983	153	100.0	30	19.8	14	9.2	17	11.3	2	1.0	9	5.9	8	5.3	70	45.1	NA	NA
Turkey																		
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.7	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.5	1	1.5
1979	40	100.0	2	3.8	13	31.4	NA	NA	5	12.8	6	15.1	4	9.5	8	19.3	NA	NA
1980	45	100.0	(c)	.7	15	33.5	1	3.1	3	6.4	5	10.5	3	6.5	14	32.4	NA	NA
1981	38	100.0	1	3.5	11	27.9	1	2.6	2	4.0	15	39.1	2	4.1	5	14.1	NA	NA
1982	37	100.0	1	2.5	14	38.3	2	6.0	2	4.3	9	23.5	2	6.3	5	13.9	NA	NA
1983	56	100.0	3	5.2	20	35.4	2	4.0	2	2.9	22	39.9	2	4.5	3	5.2	NA	NA
India																		
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	NA	NA
1979	74	100.0	5	6.1	26	34.5	8	10.8	15	20.6	3	4.4	9	12.1	5	6.8	2	2.2
1980	88	100.0	7	8.3	34	39.1	11	12.3	13	14.8	4	4.9	13	15.2	2	1.8	NA	NA
1981	119	100.0	13	11.2	43	35.9	21	17.4	19	15.8	3	2.8	12	10.0	3	2.5	NA	NA
1982	136	100.0	15	10.8	48	35.4	20	14.7	12	8.8	4	2.6	19	14.1	1	.9	NA	NA
1983	113	100.0	4	3.8	39	34.6	34	29.9	13	11.5	4	3.6	12	11.0	2	1.3	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1977	45	100.0%	$ 8	16.9%	$ 15	34.1%	$ 1	1.8%	$ 2	5.1%	$ 7	14.9%	$ 2	4.1%	$ 9	19.9%	$ 1	1.2%
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.8	1	4.5	(c)	1.3
1979	47	100.0	15	32.7	11	22.5	8	16.3	1	1.8	7	14.2	2	3.9	3	5.6	1	1.2
1980	31	100.0	6	19.3	6	21.0	3	9.7	1	2.1	7	21.4	3	10.9	1	5.2	NA	NA
1981	51	100.0	14	26.4	12	23.5	4	7.6	1	2.5	7	13.1	4	7.3	3	9.3	NA	NA
1982	46	100.0	15	31.7	8	18.0	3	6.2	1	1.4	8	17.5	6	12.1	1	4.7	NA	NA
1983	59	100.0	21	34.8	11	18.4	7	11.6	1	1.5	9	15.8	5	8.1	2	3.2	NA	NA
China																		
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	1	1.7	2	2.8	NA	NA	NA	NA
1979	112	100.0	NA	NA	34	30.7	30	27.0	24	21.1	4	4.0	3	2.4	NA	NA	NA	NA
1980	119	100.0	6	5.2	36	30.5	25	20.8	14	11.7	2	1.5	9	7.1	2	1.4	NA	NA
1981	74	100.0	1	2.0	13	17.2	24	32.4	20	26.7	1	1.6	2	3.1	2	2.6	NA	NA
1982	54	100.0	2	4.2	8	14.2	11	19.9	30	55.5	1	1.0	(c)	.6	1	1.7	NA	NA
1983	63	100.0	13	21.1	9	13.9	10	16.2	23	35.8	3	4.8	4	6.0	(c)	.5	NA	NA
Argentina																		
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	42.0	1	1.0	6	8.2	16	20.6	NA	NA	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	NA	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
1980	61	100.0	11	17.9	14	22.7	2	3.7	6	9.8	19	31.0	4	7.2	3	4.4	NA	NA
1981	50	100.0	7	14.1	16	32.2	2	4.9	4	7.6	7	14.7	4	8.1	4	8.6	NA	NA
1982	27	100.0	7	26.4	8	29.2	1	4.9	4	13.5	3	10.6	1	2.4	3	10.0	NA	NA
1983	14	100.0	1	8.3	5	36.6	3	22.4	(c)	2.6	3	22.3	0	.0	(c)	1.7	NA	NA
Eastern Europe																		
U.S.S.R.																		
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	NA	NA	42	6.7	5	.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7
1980	648	100.0	19	2.9	349	53.8	66	10.1	73	11.3	33	5.1	19	2.9	62	9.5	NA	NA
1981	419	100.0	16	3.8	203	48.4	55	13.1	48	11.5	40	9.6	13	3.0	28	6.8	NA	NA
1982	439	100.0	1	.3	213	48.5	48	10.9	78	17.8	40	9.2	7	1.6	18	4.2	NA	NA
1983	542	100.0	7	1.4	267	49.1	80	14.8	66	12.1	49	9.1	14	2.7	14	2.5	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1977	$203	100.0%	$ 8	4.0%	$54	26.8%	$41	20.1%	$25	12.4%	$21	10.1%	$21	10.4%	$12	5.7%	$6	3.1%
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.7	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	NA	NA	17	9.2	16	8.5	34	17.9	8	4.4	3	1.9
1980	91	100.0	2	1.8	31	34.3	6	6.2	17	18.2	9	9.7	11	11.7	11	11.8	NA	NA
1981	96	100.0	(c)	.0	47	49.4	19	20.2	14	14.7	6	6.7	3	3.4	3	2.6	NA	NA
1982	76	100.0	1	.8	62	81.9	0	.0	6	7.8	3	3.9	1	1.8	(c)	.3	NA	NA
1983	39	100.0	5	13.2	14	37.5	1	3.1	7	17.5	3	7.2	5	11.9	1	1.5	NA	NA
Rumania																		
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
1980	98	100.0	2	1.7	19	19.9	3	3.3	6	5.9	26	27.1	4	4.1	25	25.6	NA	NA
1981	46	100.0	1	3.0	16	35.5	6	13.9	4	8.0	12	25.6	4	7.6	1	2.3	NA	NA
1982	7	100.0	3	44.8	2	22.7	(c)	.9	1	12.3	(c)	2.5	1	15.5	0	.0	NA	NA
1983	18	100.0	(c)	.1	3	17.5	0	.0	1	5.3	8	43.7	(c)	.7	4	23.5	NA	NA
Yugoslavia																		
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	NA	NA	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	1	.5
1980	119	100.0	2	1.6	59	49.3	(c)	.2	16	13.1	24	20.1	4	3.1	12	10.0	NA	NA
1981	77	100.0	3	4.1	40	51.9	4	5.7	13	16.6	9	11.5	2	2.8	3	3.8	NA	NA
1982	87	100.0	1	.7	46	52.5	1	1.1	13	15.2	10	11.5	1	1.2	11	12.8	NA	NA
1983	107	100.0	1	.7	68	63.9	2	1.8	18	16.4	8	7.4	1	.6	4	3.6	NA	NA
Czechoslovakia																		
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	.3	49	64.3	NA	NA	12	15.8	6	7.3	2	2.0	2	3.1	1	.8
1979	82	100.0	NA	NA	54	65.8	1	.6	17	20.8	3	4.0	1	1.2	1	1.7	3	3.2
1980	61	100.0	(c)	.1	33	54.6	1	1.3	10	16.0	8	13.6	2	3.1	4	6.3	NA	NA
1981	39	100.0	1	3.2	25	65.2	(c)	.9	6	15.6	1	3.0	2	4.8	1	2.4	NA	NA
1982	37	100.0	0	.0	17	46.8	2	6.5	10	27.8	1	3.1	1	2.0	2	5.1	NA	NA
1983	42	100.0	1	3.2	27	63.9	1	1.8	9	21.0	1	3.1	(c)	.3	(c)	.4	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1977	$50	100.0%	$2	3.4%	$32	63.6%	$3	7.0%	$5	10.4%	$1	2.0%	$1	1.7%	$1	1.9%	$1	1.6%
1978	48	100.0	(c)	.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	NA	NA
1979	62	100.0	1	1.8	44	70.9	NA	NA	6	9.1	3	4.3	NA	NA	2	3.1	1	1.5
1980	36	100.0	1	3.7	18	51.5	1	4.0	6	16.9	3	7.6	1	3.8	2	5.1	NA	NA
1981	28	100.0	1	3.3	15	54.4	1	5.1	6	23.5	1	2.1	(c)	.8	(c)	1.0	NA	NA
1982	17	100.0	1	7.5	9	50.2	(c)	.4	3	17.2	2	11.9	(c)	.0	(c)	2.2	NA	NA
1983	21	100.0	0	.0	9	43.1	6	26.8	4	17.6	1	3.4	(c)	.0	1	3.9	NA	NA

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.
(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are - United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.
(c) Less than $500,000.
(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports," Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 516	$ 0	$ 2	$ 0	$ 195	$ 0
03 For fissionable material, not NC	50	0	0	49	0	0
05 Electro erosion, electric, ultrasonic, NC	151,008	70,048	29,630	22,913	8,126	10,354
07 Electro erosion, electric, ultrasonic, not NC	31,688	7,827	6,910	9,215	3,208	2,343
12 Center and copying multiple tool lathes, NC	170,710	46,729	34,602	11,962	16,650	40,166
14 Automatic and turret lathes, NC	171,247	61,921	28,086	18,667	15,316	29,564
16 Automatic and revolving lathes, not parallel, multiple tool, NC	96,513	20,454	15,824	21,003	9,402	21,724
22 Center and copying lathes, multiple tool, not NC	71,024	32,194	10,813	3,183	8,792	9,451
24 Automatic and turret lathes, not NC	80,442	26,666	16,467	10,436	2,905	18,505
26 Automtic and turret lathes, not parallel, multiple tool, not NC	51,527	17,719	7,002	8,477	13,428	0
36 Boring-milling machines, horizontal, NC	89,356	39,802	19,995	3,298	6,937	12,166
37 Boring machines, not boring-milling, NC	18,175	5,859	5,624	924	2,790	2,643
38 Boring-milling, horizontal, not NC	22,106	6,999	4,754	2,730	1,766	4,222
39 Boring machines, not boring-milling, not NC	12,465	2,550	800	2,511	2,462	2,161
41 Planing machines, NC	597	79	21	100	378	0
43 Planing machines, not NC	1,777	488	215	25	494	219
44 Shaping & slotting, broaching, sawing, NC	9,034	2,711	598	333	83	4,017
45 Shaping & slotting, not NC	3,716	443	415	588	426	1,472
46 Broaching machines, not NC	10,344	746	5,297	31	352	3,253
47 Sawing and cut-off machines, not NC	85,008	17,415	16,252	11,951	12,035	13,881
48 Milling machines, NC	220,657	93,549	37,416	23,019	31,907	17,561
49 Radial drilling machines, NC	7,092	2,436	786	299	598	2,416
51 Piercing machines, not drilling, NC	72,734	35,916	11,932	12,640	4,593	5,120
52 Milling machines, not NC	130,021	42,578	21,152	15,303	25,345	14,427
53 Radial drilling machines, not NC	11,026	3,844	1,790	1,010	2,598	1,177
54 Other drilling machines	47,141	13,464	7,490	2,257	9,097	9,153
55 Cylindrical and surface grinding machines (micrometric), NC	85,906	25,952	17,736	13,064	7,610	18,068
56 Grinding, honing, polishing, lapping (micrometric), NC	36,449	19,150	5,951	2,516	5,058	1,246
57 Surface grinding machines, plane surface (micrometric), not NC	34,791	8,083	7,707	2,445	6,109	6,935
58 Surface grinding machines, cylindrical surface (micrometric), not NC	66,617	25,481	11,509	3,583	4,511	15,812
59 Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	67,604	21,375	8,229	10,257	8,083	15,516
61 Grinding, honing, polishing, lapping, (micrometric), not NC	54,089	16,930	3,980	7,555	3,659	17,593
62 Grinding, honing, polishing, lapping (not micrometric), NC	15,583	9,337	3,460	1,456	653	0
63 Grinding, honing, polishing, lapping (not micrometric), not NC	68,171	16,187	21,885	7,504	9,867	3,033
64 Jig boring & milling machines, NC	235,771	60,260	20,007	1,784	134,895	9,202
65 Jig boring & milling machines, not NC	8,791	2,167	365	1,837	1,093	2,577
66 Gear cutting machines, cylindrical, NC	9,671	0	3,736	412	2,719	2,175
68 Gear cutting machines, cylindrical, not NC	11,438	1,155	2,518	2,471	473	4,153
69 Gear cutting machines, noncylindrical, NC	4,881	0	2,286	622	749	0
71 Gear cutting machines, noncylindrical, not NC	16,236	8,519	1,287	4,227	1,072	620
93 Screwing and tapping machines by cutting	16,399	2,140	2,958	1,753	2,618	3,931
94 Other metal cutting machines	240,209	12,430	65,094	8,670	7,536	129,658
Total Imports, cutting (EEC)	$2,538,580	$781,603	$462,581	$253,080	$376,588	$456,514

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)
(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 34,264	$ 11,515	$ 3,505	$ 5,715	$ 6,108	$ 2,534
75 Presses, NC, other than 8445.81, 82, 88	23,713	7,421	5,081	4,135	1,601	3,839
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	50,388	19,649	7,414	2,115	7,912	6,959
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83 87, 89	28,156	19,030	2,722	3,029	307	1,811
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83 87, 89	69,789	14,300	23,602	8,394	10,974	5,211
81 Rolling, bending, folding and planing machines, NC	50,164	20,903	5,222	2,134	8,679	5,924
82 Shearing, punching and stamping, NC	102,771	17,120	26,151	9,464	21,589	12,959
83 Rolling, bending, folding and planing machines, not NC	40,102	11,341	5,236	2,491	6,846	9,256
84 Rolling, bending, folding and planing, not flat products, not NC	47,351	9,262	10,602	4,053	10,432	5,963
85 Hydraulic shearing machines, not NC	35,449	9,753	6,501	795	10,232	5,375
86 Nonhydraulic shearing machines, not NC	24,699	5,207	4,861	1,548	7,275	2,543
87 Punching and stamping machines, not NC	34,715	13,660	3,671	1,490	8,289	3,161
88 Forging and stamping, NC	7,967	526	126	92	996	3,049
89 Forging and stamping, not NC	21,506	6,074	2,805	1,322	1,322	1,051
92 Forming by drawing, bars, tubes, wire etc.	15,600	2,990	1,503	3,517	4,104	2,056
95 Screwing and tapping machines not by cutting	8,420	2,295	1,409	2,008	487	1,186
96 Other metal forming machines for working flat products	14,002	3,247	5,355	723	1,668	2,723
97 Other machines for working wire	51,946	15,277	13,475	4,734	4,315	6,328
Total imports, forming (EEC)	$ 661,002	$189,570	$129,241	$ 57,759	$113,136	$ 81,928
98 MACHINE TOOLS NEC	152,743	26,169	27,999	37,148	19,374	19,835
Grand Total	$3,352,325	$997,342	$619,821	$347,987	$509,098	$558,277

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 18	$ 0	$ 13	$ 0	$ 0	$ 0
03 For fissionable material, not NC	58	48	0	2	0	0
05 Electro erosion, electric, ultrasonic, NC	53,897	34,985	5,706	400	583	3,328
07 Electro erosion, electric, ultrasonic, not NC	23,664	13,559	1,144	1,439	1,384	2,973
12 Center and copying multiple tool lathes, NC	116,710	94,713	1,642	6,315	6,653	5,461
14 Automatic and turret lathes, NC	219,491	193,519	9,482	2,293	3,686	8,439
16 Automatic and revolving lathes, not parallel, multiple tool, NC	87,993	42,371	5,178	27,342	2,436	7,079
22 Center and copying lathes, multiple tool, not NC	100,473	32,796	8,681	8,540	5,773	35,710
24 Automatic and turret lathes, not NC	111,089	57,032	6,685	13,351	1,413	26,745
26 Automtic and turret lathes, not parallel, multiple tool, not NC	89,562	35,107	25,504	19,527	3,447	461
36 Boring-milling machines, horizontal, NC	159,294	113,636	3,782	20,897	8,768	11,542
37 Boring machines, not boring-milling, NC	35,866	18,526	1,199	5,549	9,159	758
38 Boring-milling, horizontal, not NC	28,047	3,543	890	8,211	132	7,039
39 Boring machines, not boring-milling, not NC	36,333	19,147	3,160	9,453	368	1,649
41 Planing machines, NC	1,157	8	21	922	114	65
43 Planing machines, not NC	3,322	1,455	165	1,313	99	221
44 Shaping & slotting, broaching, sawing, NC	10,228	5,016	125	1,263	93	3,713
45 Shaping & slotting, not NC	7,225	1,697	982	1,330	62	1,740
46 Broaching machines, not NC	21,365	15,236	65	3,436	575	1,942
47 Sawing and cut-off machines, not NC	144,005	78,952	9,490	36,001	5,959	7,754
48 Milling machines, NC	358,039	233,753	18,125	65,506	2,517	24,631
49 Radial drilling machines, NC	2,890	295	186	1,333	72	829
51 Piercing machines, not drilling, NC	69,832	36,384	14,425	13,844	3,648	1,142
52 Milling machines, not NC	277,767	81,243	21,959	83,000	19,901	16,589
53 Radial drilling machines, not NC	11,769	2,491	956	2,673	1,269	1,772
54 Other drilling machines	61,890	21,899	7,249	14,612	3,595	6,446
55 Cylindrical and surface grinding machines (micrometric), NC	115,166	82,581	1,087	17,063	1,818	11,735
56 Grinding, honing, polishing, lapping (micrometric), NC	70,948	62,928	234	3,759	2,684	1,238
57 Surface grinding machines, plane surface (micrometric), not NC	105,756	70,727	1,494	14,974	634	8,996
58 Surface grinding machines, cylindrical surface (micrometric), not NC	83,891	50,713	2,353	5,398	1,445	16,633
59 Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	117,733	32,040	7,855	49,301	16,981	8,142
61 Grinding, honing, polishing, lapping, (micrometric), not NC	145,706	119,986	2,519	10,271	1,153	8,579
62 Grinding, honing, polishing, lapping (not micrometric), NC	8,097	4,145	711	2,324	187	0
63 Grinding, honing, polishing, lapping (not micrometric), not NC	129,158	66,862	11,786	29,727	11,019	506
64 Jig boring & milling machines, NC	170,785	38,003	160	30,442	100,856	595
65 Jig boring & milling machines, not NC	6,519	3,663	249	1,584	103	623
66 Gear cutting machines, cylindrical, NC	24,378	23,057	210	548	0	563
68 Gear cutting machines, cylindrical, not NC	28,081	24,502	430	1,148	244	1,693
69 Gear cutting machines, noncylindrical, NC	4,155	3,554	0	430	0	171
71 Gear cutting machines, noncylindrical, not NC	28,506	15,885	408	4,410	6,849	835
93 Screwing and tapping machines by cutting	24,764	11,590	1,230	1,925	2,241	1,185
94 Other metal cutting machines	368,078	272,342	13,722	24,017	483	50,804
Total Imports, cutting (EEC)	$3,463,705	$2,019,989	$191,262	$545,873	$228,403	$290,326

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)
(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 24,100	$ 6,726	$ 2,245	$ 6,736	$ 3,391	$ 3,932
75 Presses, NC, other than 8445.81, 82, 88	22,857	5,010	481	3,860	5,108	8,205
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	170,060	94,360	7,224	25,171	22,941	10,485
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83 87, 89	46,279	28,493	122	6,714	9,788	934
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83 87, 89	225,011	118,189	12,881	58,775	14,934	6,959
81 Rolling, bending, folding and planing machines, NC	43,158	16,936	4,120	5,555	6,049	5,957
82 Shearing, punching and stamping, NC	141,728	108,483	3,518	15,174	5,464	7,525
83 Rolling, bending, folding and planing machines, not NC	125,396	75,722	8,004	15,897	13,251	8,020
84 Rolling, bending, folding and planing, not flat products, not NC	74,937	24,324	11,753	17,662	9,570	5,966
85 Hydraulic shearing machines, not NC	66,069	27,112	8,563	3,726	17,393	1,950
86 Nonhydraulic shearing machines, not NC	71,479	34,490	5,301	21,787	2,445	4,132
87 Punching and stamping machines, not NC	44,381	23,177	2,113	4,167	10,255	2,328
88 Forging and stamping, NC	8,992	7,166	1	734	438	553
89 Forging and stamping, not NC	39,261	19,797	816	12,310	4,074	1,191
92 Forming by drawing, bars, tubes, wire etc.	80,750	52,457	774	20,760	587	5,313
95 Screwing and tapping machines not by cutting	16,343	8,761	1,804	3,237	612	803
96 Other metal forming machines for working flat products	51,487	40,249	3,361	5,876	935	906
97 Other machines for working wire	77,428	53,904	3,271	9,713	3,368	4,692
Total imports, forming (EEC)	$1,329,716	$ 745,356	$ 76,352	$237,854	$130,603	$ 79,851
98 MACHINE TOOLS NEC	354,150	72,607	41,205	189,195	20,097	23,286
Grand Total	$5,147,571	$2,837,952	$308,819	$972,922	$379,103	$393,463

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1985

Selected Countries

(Thousands of U.S. Dollars)

Countries	Total EEC	France	Netherlands	West Germany	Italy
EUROPE	$1,326,610	$278,070	$118,651	$433,968	$167,395
France	75,996	—	3,446	27,181	8,379
Belgium	49,326	9,672	7,975	13,369	3,906
Netherlands	37,458	3,421	—	12,335	1,583
West Germany	485,846	109,942	63,914	—	76,373
Italy	246,841	64,064	8,422	76,740	—
United Kingdom	87,759	14,237	5,524	21,803	7,652
Denmark	17,909	753	955	5,017	435
Sweden	59,883	3,854	2,564	17,758	9,747
Switzerland	371,264	50,770	13,719	189,101	39,674
Austria	40,683	3,512	2,317	25,373	877
Portugal	1,742	184	114	135	2
Spain	55,862	8,562	4,311	18,601	3,328
Other Europe	21,895	971	906	6,631	1,257
Ireland	6,288	171	1	1,216	23
Norway	3,135	90	223	1,424	30
Finland	6,934	545	479	1,304	350
Yugoslavia	5,008	72	198	2,436	753
Eastern Europe	74,628	8,128	4,485	19,923	14,185
U.S.S.R.	15,804	1,662	474	4,810	5,594
East Germany	17,429	2,883	1,051	(a)	3,775
Czechoslovakia	22,590	549	2,229	7,138	2,189
Hungary	5,674	404	56	3,448	334
AFRICA	2,052	24	70	117	226
South Africa	1,883	0	44	109	149
AMERICA	147,427	13,701	2,756	42,796	12,551
United States	140,489	11,735	2,483	39,695	12,345
Canada	3,242	1,947	161	323	140
Mexico	61	0	0	0	0
Colombia	3	0	0	0	3
Venezuela	2	0	0	0	2
Brazil	3,340	14	28	2,770	46
Argentina	181	0	0	8	0
ASIA	484,956	58,357	16,258	136,414	13,224
Israel	1,256	213	0	768	138
Other Near East	544	0	1	6	183
India	1,194	6	23	409	117
Singapore	1,580	0	60	911	79
South Korea	5,018	0	155	3,295	0
Japan	448,274	53,058	14,427	122,886	11,601
Taiwan	24,114	4,906	1,457	6,095	1,050
AUSTRALIA & OCEANA	660	0	1	418	1
Australia	536	0	1	413	1
TOTAL	$2,440,643	$353,377	$137,736	$613,713	$195,637

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1985

Selected Countries

(Thousands of U.S. Dollars)

Countries	United Kingdom	Sweden	Switzerland	Austria	Spain
EUROPE	$237,563	$115,821	$136,368	$100,208	$47,110
France	10,463	2,801	8,714	2,038	5,468
Belgium	7,585	1,327	1,201	719	885
Netherlands	6,517	1,706	1,117	1,181	135
West Germany	107,890	55,917	87,990	62,623	16,996
Italy	27,053	12,266	20,430	10,018	8,712
United Kingdom	6,567	10,986	5,393	1,426	4,607
Denmark	3,910	4,836	936	393	398
Sweden	10,916	—	2,074	1,201	1,976
Switzerland	33,738	11,800	—	13,612	4,359
Austria	2,523	1,413	3,919	—	181
Portugal	629	23	256	129	204
Spain	9,343	4,647	1,956	1,148	—
Other Europe	3,939	3,076	378	588	58
Ireland	2,531	14	151	238	0
Norway	320	506	111	82	14
Finland	1,044	2,475	96	18	35
Yugoslavia	44	81	5	195	0
Eastern Europe	6,490	5,022	2,004	5,132	3,131
U.S.S.R.	686	641	557	510	56
East Germany	3,050	864	208	1,738	2,231
Czechoslovakia	1,887	3,024	998	1,445	606
Hungary	61	127	206	648	0
AFRICA	1,506	0	52	0	0
South Africa	1,482	0	44	0	0
AMERICA	55,023	4,511	5,324	1,284	4,058
United States	54,008	4,447	5,253	1,087	4,038
Canada	556	64	11	17	20
Mexico	0	0	61	0	0
Colombia	0	0	0	0	0
Venezuela	0	0	0	0	0
Brazil	459	0	0	14	0
Argentina	0	0	0	166	0
ASIA	96,352	36,109	28,288	14,784	5,262
Israel	55	0	68	0	0
Other Near East	10	0	59	5	0
India	409	4	127	0	0
Singapore	405	40	0	86	0
South Korea	1,307	131	0	16	0
Japan	86,944	34,156	27,460	14,211	5,200
Taiwan	6,870	1,699	518	458	62
AUSTRALIA & OCEANA	175	0	0	0	0
Australia	113	0	0	0	0
TOTAL	$390,619	$156,478	$170,032	$116,276	$57,078

Note: Individual items may not add to totals due to rounding.

Source: Statistical Office of the European Communities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1985

Selected Countries

(Thousands of U.S. Dollars)

Countries	Total EEC	France	Netherlands	West Germany	Italy
EUROPE	$2,737,124	$117,278	$46,360	$1,179,377	$413,220
France	302,273	—	4,341	125,124	64,375
Belgium	103,982	7,070	8,003	58,096	13,282
Netherlands	118,127	3,229	—	65,511	10,362
West Germany	458,781	26,961	13,538	—	102,737
Italy	158,434	8,678	1,606	77,714	—
United Kingdom	271,776	12,507	6,669	138,047	31,157
Denmark	62,724	1,110	1,140	28,391	5,613
Sweden	127,949	2,721	1,674	74,676	12,481
Switzerland	147,504	9,010	2,498	97.012	21,690
Austria	106,616	1,686	1,535	73,930	9,494
Portugal	20,766	1,325	15	7,386	4,162
Spain	49,311	4,715	168	20,923	10,500
Other Europe	256,616	11,780	3,163	112,916	60,844
Norway	36,506	1,349	331	15,751	2,857
Finland	46,683	864	742	19,252	7,908
Yugoslavia	61,446	3,997	285	40,608	6,082
Turkey	75,486	4,368	1,135	26,950	35,202
Eastern Europe	552,266	26,487	2,011	299,652	66,524
U.S.S.R.	327,844	10,667	867	189,349	42,270
Poland	44,346	1,269	644	20,251	6,011
Czechoslovakia	57,089	1,332	35	28,990	3,887
Bulgaria	76,605	1,290	358	44,746	8,510
AFRICA	218,307	30,498	1,861	81,529	40,978
South Africa	47,685	409	440	24,431	4,909
AMERICA	886,963	28,636	10,125	319,177	149,004
United States	643,727	18,593	9,243	236,727	93,741
Canada	96,605	3,079	341	31,543	24,177
Mexico	51,226	2,913	53	20,038	7,984
Colombia	4,473	289	0	578	563
Venezuela	19,720	140	0	4,291	8,524
Brazil	18,646	186	61	11,363	2,632
Argentina	20,864	390	33	9,969	4,504
ASIA	728,180	26,636	11,130	321,774	93,285
Iraq	19,447	2,307	114	7,928	1,112
Iran	57,615	48	168	42,676	4,386
India	82,711	5,916	584	35,858	10,166
China	165,579	4,264	2,267	80,720	26,292
Japan	130,368	971	5,349	45,347	6,734
Taiwan	22,075	879	384	8,902	3,239
AUSTRALIA & OCEANA	64,763	3,054	1,416	25,404	8,010
Australia	57,210	2,639	1,402	23,472	7,182
TOTAL	$4,641,370	$206,102	$70,891	$1,927,261	$704,557

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1985

Selected Countries

(Thousands of U.S. Dollars)

Countries	United Kingdom	Sweden	Switzerland	Austria	Spain
EUROPE	$130,348	$ 88,327	$515,690	$60,761	$ 68,188
France	17,119	3,694	49,790	3,001	9,094
Belgium	6,053	456	7,611	601	2,527
Netherlands	7,631	2,846	13,182	1,682	4,559
West Germany	32,642	17,135	187,719	25,396	19,287
Italy	6,487	9,435	45,695	1,558	3,521
United Kingdom	—	12,229	38,996	2,530	9,745
Denmark	4,982	10,257	7,200	88	1,531
Sweden	9,215	—	13,875	2,418	4,119
Switzerland	7,977	2,336	—	3,504	1,801
Austria	1,347	1,218	14,995	—	1,162
Portugal	939	97	2,224	44	4,402
Spain	3,577	1,753	6,255	184	—
Other Europe	19,586	16,154	13,640	3,538	5,933
Norway	2,342	6,363	2,487	422	788
Finland	4,128	6,950	2,903	713	1,872
Yugoslavia	1,269	2,363	3,968	771	1,434
Turkey	2,436	186	1,712	1,392	965
Eastern Europe	12,794	10,716	114,508	16,216	506
U.S.S.R.	9,098	5,652	61,302	7,833	168
Poland	694	2,483	10,008	2,215	64
Czechoslovakia	2,072	624	17,714	1,167	217
Bulgaria	628	1,003	19,408	588	56
AFRICA	16,976	2,923	12,855	4,744	11,845
South Africa	7,248	634	3,341	714	5,132
AMERICA	111,834	35,943	149,011	15,025	49,567
United States	87,902	31,416	123,453	10,126	18,524
Canada	18,843	3,058	8,971	665	3,984
Mexico	2,487	507	6,675	224	9,465
Colombia	37	42	472	343	1,987
Venezuela	556	226	1,354	66	4,307
Brazil	590	136	3,413	22	46
Argentina	348	307	1,598	2,671	1,045
ASIA	70,260	10,225	150,801	12,549	13,393
Iraq	4,751	0	2,374	53	206
Iran	2,972	164	3,474	74	2,505
India	11,421	1,270	13,583	798	2,419
China	13,696	1,604	26,272	6,721	555
Japan	4,360	1,895	62,665	310	56
Taiwan	2,062	200	4,561	1,538	46
AUSTRALIA & OCEANA	12,066	1,446	7,934	700	3,847
Australia	9,671	1,298	7,049	618	3,038
TOTAL	$341,483	$138,972	$836,292	$93,783	$146,840

Note: Individual items may not add to totals due to rounding.

Source: Statistical Office of the European Communities.

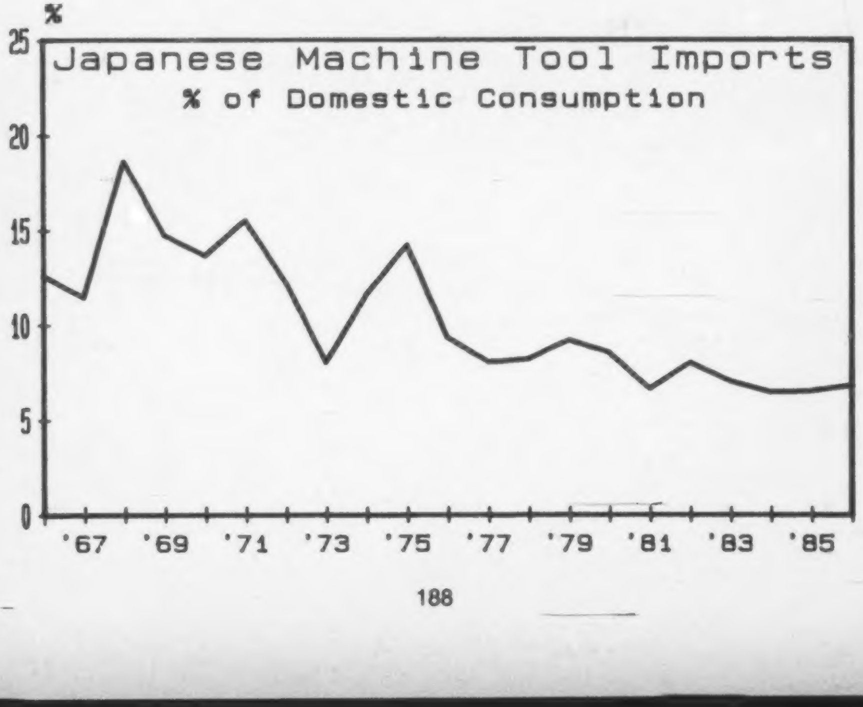
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1966 TO DATE

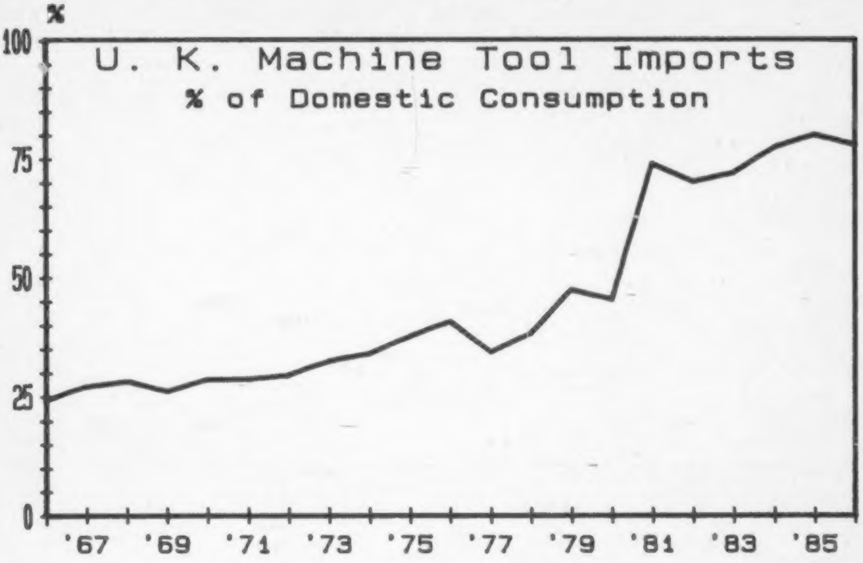
(Percent)

Year	U.S.A.	Japan	United Kingdom	West Germany
1966	7.4%	12.6%	24.3%	18.0%
1967	10.0	11.4	27.2	16.3
1968	9.8	18.6	28.3	21.4
1969	9.7	14.7	26.0	22.9
1970	9.5	13.6	28.7	23.8
1971	10.1	15.5	28.8	20.6
1972	10.0	12.2	29.6	22.1
1973	10.3	8.0	32.5	21.3
1974	13.4	11.6	34.1	23.7
1975	14.5	14.2	37.7	27.8
1976	16.1	9.3	40.8	27.7
1977	16.5	8.0	34.2	30.0
1978	21.5	8.2	38.3	29.9
1979	23.3	9.2	47.4	29.8
1980	23.6	8.5	45.3	32.8
1981	25.6	6.6	73.9	28.4
1982	27.4	8.0	70.0	25.4
1983	35.3	7.0	72.0	26.7
1984	38.1	6.4	77.4	32.5
1985(r)	40.9	6.5	80.1	30.1
1986	50.7	6.8	77.8	30.7

r - Revised.

Source: National Machine Tool Builders' Association and respective machine tool trade associations.




%
U. K. Machine Tool Imports
% of Domestic Consumption
100
75
50
25
0
'67
'69
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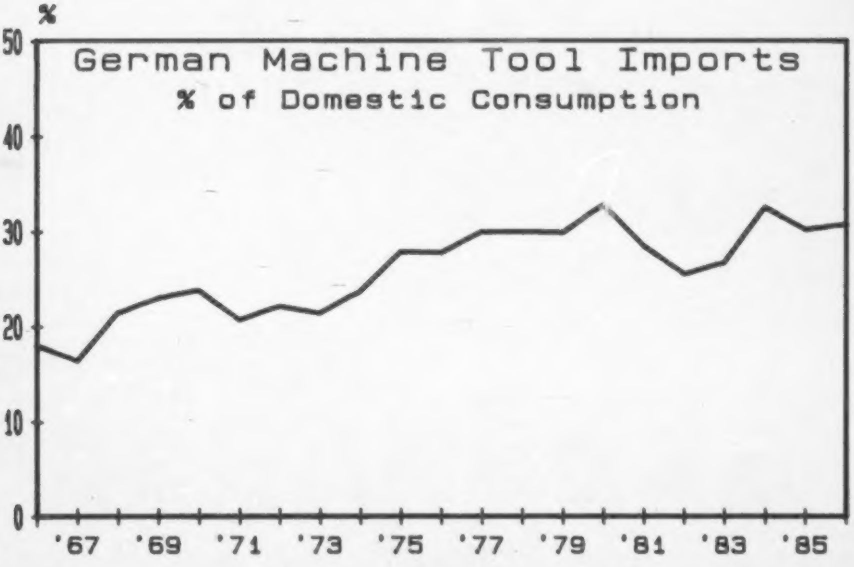
%
German Machine Tool Imports
% of Domestic Consumption
50
40
30
20
10
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'67
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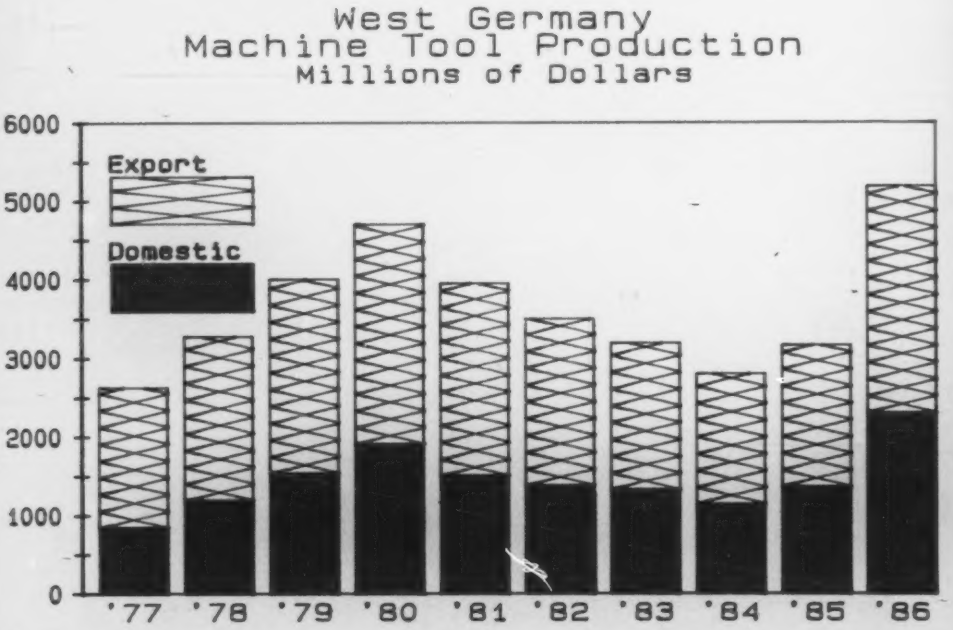
'83
'85

THE GERMAN MACHINE TOOL INDUSTRY (a)
1967 to Date

Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1967	108,000	62.9%	11.5%	$ 7,943
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	122,500	49.3	26.7	15,056
1972	117,600	55.7	21.2	15,275
1973	115,500	61.3	15.8	18,815
1974	115,800	69.0	12.8	22,541
1975	109,300	72.7	13.0	25,171
1976	101,400	70.2	9.5	27,283
1977	95,900	69.7	18.7	31,857
1978	94,800	65.0	22.9	40,326
1979	95,000	61.9	26.1	49,378
1980	98,000	62.6	29.2	55,497
1981	97,000	65.6	26.0	46,858
1982	93,000	64.2	24.1	43,377
1983	83,700	62.0	25.7	43,989
1984	83,000	64.1	28.2	39,825
1985	86,000	62.4	33.9	42,185
1986	93,000	60.6	36.8	64,445

(a) Figures include parts.

Sources: VDMA, "Statistisches Handbuch fur den Maschinenbau", annually, "Die Lage des Maschinenbaues im Jahre" annually, and official foreign trade statistics.



GERMAN PRODUCTION OF MACHINE TOOLS

1983 to Date

(Values in Thousands of U.S. Dollars)

Machine Classifications	1983		1984		1985		1986	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	156,562	$3,681,878	157,054	$3,305,498	165,750	$3,712,242	124,884	$5,993,406
Metal Cutting Total	89,810	$2,557,399	88,475	$2,295,207	98,286	$2,594,486	82,354	$4,275,026
Planing, Shaping and Broaching	518	27,430	370	15,940	397	21,444	404	27,034
Lathes	6,325	289,814	6,477	234,255	6,367	239,838	6,892	377,892
Turret Lathes, Automatic	2,487	288,548	2,652	239,810	2,786	285,446	3,274	467,116
Boring and Drilling	13,297	98,993	12,877	77,426	13,380	89,403	15,212	139,058
Milling Machines, Horizontal Boring and Milling Machines	7,763	376,006	8,341	361,992	8,080	407,821	8,883	652,990
Saws and Filing Machines	18,375	71,478	12,434	63,089	14,284	72,681	11,446	112,209
Grinding, Honing and Polishing	27,931	375,684	30,425	321,534	35,602	408,238	16,338	668,729
Gear Cutting Machines	785	97,280	690	83,571	923	106,252	1,133	185,960
Other Metal Cutting Machine Tools	12,329	626,397	14,207	573,545	16,467	607,156	18,772	1,112,675
Parts and Accessories	—	305,769	—	324,043	—	356,208	—	531,364
Metal Forming Total	66,752	1,124,479	68,579	1,010,291	67,464	1,117,755	42,530	1,718,379
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	3,909	130,647	3,436	96,829	3,564	108,409	4,079	151,562
Mechanical Presses	10,256	157,383	12,077	106,774	11,307	159,361	13,841	267,118
Hydraulic Presses	2,279	215,142	5,517	171,955	1,979	149,927	2,165	255,471
Sheet Metalworking Machines, Including Shears	42,868	248,599	40,699	259,818	42,498	305,475	14,509	467,872
Wire Working Machines	7020	157,783	6,411	147,602	7,720	174,372	7,526	242,546
Bolt, Screw and Nut Making Machines	420	32,278	439	49,591	396	32,591	410	57,121
Parts and Accessories	—	182,646	—	177,721	—	187,620	—	276,690

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1983 $1 = 2.5533 Deutsche Mark; 1984 $1 = 2.8459 Deutsche Mark; 1985 $1 = 2.9440 Deutsche Mark; 1986 $1 = 2.1715 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Fachgemeinschaft Werkzeugmaschinen, from official foreign trade statistics.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS
1984 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	184,065	$2,125,073	189,934	$2,315,393	86,936	$3,633,776
Metal Cutting Total	154,490	$1,365,421	159,505	$1,416,448	55,422	$2,282,723
Planing, Shaping and Broaching	391	11,435	288	8,812	365	18,324
Lathes	3,050	158,328	3,175	144,116	2,921	204,210
Turret Lathes, Automatic	2,511	148,959	2,621	164,917	2,528	249,031
Drilling	6,926	69,660	12,206	68,006	10,208	139,878
Milling Machines, Horizontal Boring and Milling Machines	6,934	269,864	6,262	249,830	7,328	430,480
Saws and Filing Machines	9,605	51,650	9,862	57,065	8,985	83,628
Grinding, Honing and Polishing	119,957	267,763	119,573	299,407	17,550	488,128
Gear Cutting Machines	590	42,081	545	44,565	554	66,744
Other Metal Cutting Machine Tools	4,526	175,183	4,973	196,599	4,983	331,144
Parts and Accessories	—	170,499	—	183,132	—	271,156
Metal Forming Total	26,376	605,219	27,927	735,132	28,218	1,100,667
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	3,074	46,217	3,129	76,539	2,917	57,091
Mechanical Presses	2,970	56,485	4,067	56,263	4,680	122,465
Hydraulic Presses	1,559	53,750	1,828	57,732	1,387	96,262
Sheet Metalworking Machines, Including Shears	8,039	137,905	8,493	187,703	9,083	286,658
Wire Working Machines	5,012	103,721	5,318	124,056	5,759	193,020
Bolt, Screw and Nut Making Machines	550	27,844	551	29,302	536	41,552
Other Metal Forming Machine Tools	5,172	43,642	4,541	41,723	3,856	72,306
Parts and Accessories	—	135,654	—	161,814	—	231,314
Other Metal Working Machines (including Parts and Accessories)	3,199	154,433	2,502	163,813	3,296	250,386

Exchange rate: 1984 $1 = 2.8459 Deutsche Mark; 1985 $ 1 = 2.9440 Deutsche Mark; 1986 $1 = 2.1715 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN IMPORTS OF MACHINE TOOLS

1984 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	70,248	$598,903	83,345	$785,007	69,292	$1,337,104
Metal Cutting Total	50,915	$375,114	64,891	$516,495	49,669	$ 905,935
Planing, Shaping and Broaching	153	1,137	126	1,513	156	1,749
Lathes	5,868	45,711	7,245	65,380	9,322	116,653
Turret Lathes, Automatic	1,056	31,188	1,336	46,987	1,905	88,253
Drilling	6,266	51,640	6,926	67,893	9,145	125,914
Milling Machines, Horizontal Boring and Milling Machines	4,097	64,763	4,640	98,721	7,003	182,235
Saws and Filing Machines	6,989	9,438	6,716	12,630	9,646	20,012
Grinding, Honing and Polishing	23,127	61,241	35,282	84,356	9,379	141,954
Gear Cutting Machines	61	7,650	81	7,838	75	9,637
Other Metal Cutting Machine Tools	3,278	39,288	2,539	55,032	3,038	92,197
Parts and Accessories	—	63,057	—	76,145	—	127,332
Metal Forming Total	15,187	179,619	16,079	218,872	16,776	354,406
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	2,101	11,206	1,944	7,687	1,644	13,339
Mechanical Presses	1,315	9,986	1,455	12,342	2,146	21,639
Hydraulic Presses	1,482	13,994	1,452	15,295	1,260	26,924
Sheet Metalworking Machines, Including Shears	4,348	40,666	4,652	49,603	5,245	77,756
Wire Working Machines	2,396	27,396	2,840	35,050	2,802	51,600
Bolt, Screw and Nut Making Machines	296	8,775	309	9,145	465	25,365
Other Metal Forming Machine Tools	3,249	14,725	3,427	16,656	3,214	26,071
Parts and Accessories	—	52,871	—	73,095	—	121,713
Other Metal Working Machines (including Parts and Accessories)	4,146	44,170	2,375	49,640	2,847	66,763

Exchange rate: 1984 $1 = 2.8459 Deutsche Mark; 1985 $1 = 2.9440 Deutsche Mark; 1986 $1 = 2.1715 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1986
(Thousands of U.S. Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$2,011,567	$139,878	$66,744	$488,128	$249,031	$204,210	$430,480	$83,628	$18,324	$331,144
EUROPE	1,299,914	100,071	36,054	259,079	184,400	128,683	278,693	62,217	13,679	237,038
France	146,450	13,846	7,867	22,114	26,809	8,300	23,638	8,653	3,199	32,024
Belgium-Luxembourg	53,167	5,959	2,684	11,950	6,130	7,104	12,170	2,235	337	4,598
Netherlands	68,141	6,668	771	11,503	9,219	8,773	18,318	6,196	208	6,485
Italy	88,337	4,720	3,584	18,091	11,524	9,265	20,738	5,526	110	14,779
United Kingdom	141,825	7,091	2,345	24,101	20,827	10,088	26,810	7,487	3,337	39,739
Ireland	4,055	1,272	—	807	782	17	470	182	—	525
Denmark	34,921	5,421	768	3,745	8,248	4,367	5,300	3,228	82	3,762
Norway	17,589	796	—	2,582	2,064	686	3,885	3,012	6	4,557
Sweden	77,220	6,895	3,259	12,805	15,437	3,671	21,230	4,528	431	8,964
Switzerland	135,748	15,171	2,456	28,943	15,871	15,721	34,675	5,699	400	16,722
Austria	127,303	9,606	1,841	17,228	11,780	12,481	22,893	4,292	401	46,781
Portugal	4,376	194	—	2,776	191	48	887	117	1	162
Spain	15,055	1,410	1,184	3,422	2,741	2,171	1,928	780	22	1,397
Yugoslavia	53,613	1,594	63	8,930	6,996	9,232	21,537	350	297	4,612
U.S.S.R.	207,674	6,724	4,742	58,232	34,132	21,168	35,801	2,974	3,120	40,781
Poland	17,477	1,860	580	5,258	3,516	2,650	1,466	1,480	—	667
Czechoslovakia	21,157	283	611	6,728	—	3,901	5,121	1,942	389	2,182
Hungary	7,394	177	376	1,835	408	644	983	191	16	2,764
Romania	1,400	116	—	173	—	27	243	—	841	—
Bulgaria	43,020	8,341	462	8,635	2,768	5,092	14,405	332	65	2,920
AFRICA	30,131	1,050	3	6,669	1,289	10,357	5,944	1,087	541	3,221
South Africa	6,348	41	—	2,525	631	1,773	1,088	169	51	70
AMERICA	356,561	21,688	13,580	118,521	39,222	22,065	74,490	11,475	503	55,017
United States	285,674	18,461	12,917	100,881	29,293	13,331	55,514	6,735	218	48,324
Canada	26,511	1,611	54	7,769	1,584	3,580	4,400	4,303	40	3,170
Mexico	17,185	919	—	2,370	3,597	1,035	7,743	124	103	1,294
Venezuela	1,388	35	—	288	—	139	855	57	—	14
Brazil	17,759	188	369	5,952	4,022	3,149	2,427	43	3	1,606
Argentina	2,967	262	—	459	—	348	1,611	65	—	202
ASIA	305,470	16,623	16,933	101,092	22,944	39,567	67,645	7,686	3,602	29,378
Iran	20,191	711	383	5,261	1,458	5,892	3,145	997	189	2,155
Israel	8,314	1,311	268	1,805	797	280	1,305	567	—	1,981
Other Near East	11,135	860	—	1,365	2,586	1,009	3,493	794	45	983
India	36,960	1,720	4,075	14,577	3,715	1,880	8,141	676	38	2,158
Indonesia	2,800	200	357	476	—	945	481	303	38	—
Singapore	4,616	528	—	797	540	1,154	1,038	220	187	152
China	112,601	6,299	6,721	27,796	6,776	7,193	37,907	2,226	1,089	16,594
Japan	61,922	1,823	4,513	33,611	2,189	13,975	923	1,452	15	3,421
Korea	30,187	2,895	578	10,221	3,446	2,861	6,994	122	1,876	1,194
Taiwan	7,403	18	—	2,764	245	2,820	952	96	7	501
AUSTRALIA & OCEANA	19,459	445	174	2,767	1,176	3,537	3,708	1,163	—	6,489
Australia	18,913	384	174	2,432	1,176	3,537	3,697	1,027	—	6,486

Exchange Rate: $1 = 2.1715 Deutsche Mark.

(a) Excludes parts.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1986

(Thousands of U.S. Dollars)

Country of Destination	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$869,354	$57,091	$122,465	$96,262	$286,658	$193,020	$41,552	$72,306
EUROPE	480,881	30,727	45,968	41,276	181,818	106,621	29,583	44,888
France	55,557	2,296	6,340	6,596	20,851	8,892	2,368	7,214
Belgium-Luxembourg	22,335	694	1,388	1,254	11,631	5,010	1,802	556
Netherlands	42,536	1,895	5,306	10,306	18,150	4,706	141	2,032
Italy	41,320	2,375	1,888	4,500	11,725	12,388	2,402	6,042
United Kingdom	40,902	3,624	3,442	3,148	13,029	9,973	2,063	5,623
Ireland	2,788	510	296	65	1,014	847	—	56
Denmark	10,998	913	949	1,228	5,825	967	158	958
Norway	10,019	911	1,423	286	4,457	2,165	74	703
Sweden	18,762	1,374	1,598	630	9,001	3,361	1,743	1,055
Switzerland	47,447	2,145	4,333	5,425	22,204	8,729	1,510	3,101
Austria	34,302	1,742	5,462	3,473	15,248	4,327	966	3,084
Portugal	2,519	197	303	187	968	603	41	220
Spain	13,415	940	1,633	583	5,647	2,951	637	1,024
Yugoslavia	13,287	1,985	1,239	289	4,017	2,347	1,054	2,356
U.S.S.R.	59,893	7,125	4,016	425	17,401	13,976	10,016	4,934
Poland	8,937	1	1,104	—	2,888	3,026	118	1,800
Czechoslovakia	17,094	503	2,525	1,184	5,610	6,723	—	549
Hungary	3,637	29	317	137	1,211	915	50	978
Romania	146	—	138	—	—	—	—	8
Bulgaria	12,047	269	153	466	3,949	4,372	2,646	192
AFRICA	20,870	1,070	2,379	790	5,404	9,185	529	1,513
South Africa	3,361	340	217	81	716	1,780	—	227
AMERICA	184,831	9,689	60,683	37,736	29,858	33,335	3,321	10,209
United States	114,853	8,361	53,270	4,243	24,426	17,659	1,569	5,325
Canada	44,666	533	5,041	31,894	1,710	4,319	16	1,153
Mexico	8,648	328	1,459	1,381	1,487	2,501	693	799
Venezuela	3,394	136	19	12	200	2,956	—	71
Brazil	9,931	125	194	160	1,150	4,551	985	2,766
Argentina	1,492	13	536	—	762	75	55	51
ASIA	170,325	14,671	13,121	16,453	64,402	39,086	7,995	14,597
Iran	10,854	672	730	1,224	3,730	4,117	96	285
Israel	5,584	68	1,484	154	517	1,855	356	1,150
Other Near East	7,866	397	544	3,137	2,486	941	17	344
India	21,848	3,528	2,424	3,321	6,465	4,239	357	1,514
Indonesia	2,003	94	50	143	774	907	35	—
Singapore	1,150	204	106	76	172	551	—	41
China	72,438	2,286	3,523	3,719	40,410	16,518	3,101	2,881
Japan	23,438	1,184	326	3,243	5,317	4,682	2,691	5,995
Korea	13,145	4,684	359	145	3,102	2,903	1,031	921
Taiwan	4,386	945	1,614	—	374	956	242	255
AUSTRALIA & OCEANA	12,445	934	314	7	5,176	4,792	124	1,098
Australia	9,062	792	159	3	3,331	3,625	94	1,058

Exchange Rate: $1 = 2.1715 Deutsche Mark.

(a) Includes other metalworking machines.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1986
(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$778,604	$125,914	$9,637	$141,954	$88,253	$116,653	$182,235	$20,012	$1,749	$92,197
EUROPE	534,890	45,918	4,382	130,805	58,370	68,888	146,021	16,335	1,495	62,676
France	31,512	1,507	—	1,537	10,055	2,159	12,083	2,201	60	1,910
Belgium-Luxembourg	8,517	658	468	521	418	3,254	3,009	86	—	103
Netherlands	7,924	1,344	37	2,705	460	1,352	1,078	667	7	274
Italy	79,907	8,103	223	22,573	6,683	9,813	23,560	5,453	700	2,799
United Kingdom	30,340	3,714	349	4,431	2,506	6,821	7,214	559	210	4,536
Denmark	4,156	244	98	2,198	594	132	454	18	23	395
Sweden	17,546	1,299	—	8,446	1,614	5,050	697	55	25	360
Switzerland	260,621	24,354	3,070	75,388	24,711	14,921	62,173	4,602	197	51,205
Austria	34,795	255	23	6,791	7,704	14,790	4,049	1,063	35	65
Spain	22,240	1,772	—	1,163	1,795	2,916	13,360	637	123	474
Yugoslavia	4,198	110	9	1,825	18	655	1,496	82	—	3
U.S.S.R.	4,796	286	—	1,191	490	749	2,052	15	—	13
Poland	3,856	51	—	140	42	1,689	1,858	76	—	—
Czechoslovakia	13,091	1,269	61	841	897	2,020	7,989	—	—	14
Hungary	5,165	369	—	632	227	956	2,958	—	3	—
Romania	1,372	172	—	145	—	165	890	—	—	—
Other Europe	4,854	391	44	278	156	1,446	1,101	801	112	525
United States	19,331	2,699	5,066	6,725	684	1,575	1,854	254	79	395
Japan	192,678	69,031	—	1,324	27,763	33,064	31,022	1,864	—	28,610
China	4,872	466	—	401	762	2,251	992	—	—	—
Korea	4,362	227	—	—	—	4,134	—	—	—	1
Taiwan	14,009	6,992	—	1,669	147	3,158	1,548	198	23	274
All Other Countries	8,468	583	191	1,030	528	3,583	800	1,361	152	240

Exchange Rate: $1 = 2.1715 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1986

(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$242,694	$13,339	$21,639	$26,924	$77,756	$51,600	$25,365	$26,071
EUROPE	198,734	12,812	20,526	25,757	60,125	43,809	11,027	24,678
France	13,338	525	1,050	3,071	2,101	2,696	787	3,108
Belgium-Luxembourg	15,777	360	4,393	2,939	5,839	691	1,080	475
Netherlands	10,311	878	354	1,561	5,669	546	474	829
Italy	47,469	3,702	5,143	3,202	16,315	5,485	5,462	8,160
United Kingdom	6,803	1,461	918	592	1,429	1,128	405	870
Denmark	3,785	319	347	532	2,262	156	—	169
Sweden	4,434	381	121	1,144	863	1,631	6	288
Switzerland	71,865	3,345	3,709	11,188	20,651	20,981	2,510	9,481
Austria	8,712	789	190	935	2,339	3,483	19	957
Spain	8,702	128	1,417	100	921	5,779	210	147
Yugoslavia	961	—	787	139	—	24	—	11
U.S.S.R.	813	73	692	—	38	—	—	10
Poland	378	172	—	116	21	69	—	—
Czechoslovakia	1,130	411	630	—	63	1	—	25
Hungary	751	—	—	—	236	463	—	52
Romania	174	—	—	51	123	—	—	—
Other Europe	3,331	268	775	187	1,255	676	74	96
United States	18,906	325	494	343	4,981	4,994	6,564	1,205
Japan	22,876	11	575	397	12,196	1,912	7,686	99
China	86	—	—	—	—	86	—	—
Korea	6	—	—	—	—	6	—	—
Taiwan	42	—	1	—	17	1	—	23
All Other Countries	2,037	191	41	426	435	790	88	66

NA – Not Available. Exchange Rate: $1 = 2.1715 Deutsche Mark.

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW – Fachgemeinschaft Werkzeugmaschinen and VDMA.

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1967 to Date

(Millions of U.S. Dollars)

Year	Production	Imports	Exports	Domestic Consumption
1967	$ 350.1	$ 35.7	$ 49.0	$ 336.8
1968	488.9	94.9	51.6	532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	750.5	113.6	80.1	783.2
1972	675.6	74.1	90.8	658.9
1973	1,117.0	78.3	129.3	1,066.0
1974	1,230.2	127.6	197.8	1,160.0
1975	774.9	72.7	207.6	640.0
1976	764.3	46.8	256.5	554.6
1977	1,165.1	58.5	430.1	793.5
1978	1,738.7	93.3	770.4	1,061.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,012.3	168.6	1,188.9	1,992.0
1981	3,860.3	175.1	1,409.2	2,626.3
1982	3,141.5	175.0	994.1	2,322.4
1983	2,953.6	136.9	999.7	2,090.8
1984	3,709.6	123.2	1,319.9	2,512.9
1985	4,406.4	147.5	1,656.1	2,897.8
1986	5,342.1	197.3	2,157.6	3,381.7

Exchange rate: 1967 – 1970 $1 = 360 Yen; 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen; 1985 $ 1 = 238.54 Yen; 1986 $1 = 168.52 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1968 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1968	21,905	$160.8	$ 12.9	$38.9
1969	23,033	195.8	18.3	39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,654	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	936.8	276.3	40.4
1982	20,443	653.3	269.3	45.3
1983	21,895	588.2	254.3	34.1
1984	31,719	761.7	419.3	58.4
1985(r)	28,110	910.2	522.9	71.5
1986	22,892	1,535.4	905.8	75.0

r – Revised.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Number of Employees, 1965 to Date

Year	Employees	Year	Employees
1965	37,377	1976	34,509
1966	33,719	1977	32,168
1967	35,141	1978	28,154
1968	40,092	1979	31,113
1969	44,806	1980	33,737
1970	49,161	1981	33,420
1971	50,630	1982	34,204
1972	46,738	1983	33,705
1973	45,242	1984	33,628
1974	45,295	1985	34,644
1975	40,925	1986	35,306

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1985 and 1986

(Values in Thousands of U.S. Dollars)

	1985(r)			1986		
Type of Machine	Production	Exports	Imports	Production	Exports	Imports
Total						
Units	28,110	29,773	2,628	22,892	27,790	2,992
Value	$910,195	$522,902	$71,456	$1,535,450	$905,803	$75,047
Hydraulic Presses						
Units	7,464	1,763	66	6,619	2,133	94
Value	$139,922	$ 54,205	$ 6,150	$ 210,201	$ 87,307	$ 2,528
Mechanical Presses						
Units	11,559	2,437	473	9,566	2,641	350
Value	$558,832	$168,944	$18,127	$1,088,992	$492,345	$17,137
Forging & Stamping Machines						
Units	838	420	25	612	275	30
Value	$ 41,347	$ 25,916	$ 4,502	$ 48,855(a)	$ 29,290	$ 7,257
Shearing Machines						
Units	5,608	6,962	293	4,339	7,611	256
Value	$ 82,104	$ 83,114	$ 7,177	$ 99,282	$125,825	$ 5,109
Bending Machines						
Units	1,236	2,791	156	985	2,046	366
Value	$ 36,329	$ 49,627	$ 4,704	$ 42,280	$ 61,221	$10,349
Wire Forming Machines						
Units	1,405	157	20	771	130	3
Value	$ 51,656	$ 4,012	$ 1,987	$ 45,840	$ 7,542	$ 979
Other Metal Forming Machines						
Units	—	15,243	1,593	—	12,954	1,893
Value	—	$137,076	$28,809	—	$102,279	$31,676

r – Revised. Exchange rate: 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen.

(a) Does not include Stamping.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, 1986

(Values in Thousands of U.S. Dollars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	137,226	$5,342,126	433,243	$2,157,643	15,851	$197,253
Horizontal Boring Machines	204	36,702	121	15,345	8	1,371
Jig Boring Machines	708	22,264	—	—	—	—
Boring Machines, NC	208	65,512	95	27,617	7	3,691
Boring Machines, N.E.C.	441	9,002	213	16,568	19	878
Radial Drilling Machines	841	16,040	90	1,679	—	—
Multi-Spindle Drilling Machines	307	7,530	346	47,864	—	—
Bench Drilling Machines	21,414	11,334	4,942	2,534	—	—
Drilling Machines, NC	1,339	42,155	767	40,512	8	795
Drilling Machines, N.E.C.	2,506	15,565	1,616	13,304	6,809	2,083
Gear Hobbing Machines	436	40,114	110	8,136	166	28,448
Gear Cutting Machines, N.E.C.	134	20,223	83	5,436		
Gear Finishing Machines	379	36,904	61	5,335		
Cylindrical Grinding Machines	1,669	153,145	249	28,667	98	7,495
Internal Grinding Machines	545	56,201	104	11,091	39	2,255
Surface Grinding Machines	4,356	142,630	1,092	29,777	826	18,128
Centerless Grinding Machines	753	63,363	170	16,983	—	—
Tool Grinding Machines (Universal)	1,318	36,506	123	1,940	—	—
Grinding Machines, NC	1,059	131,474	360	62,675	173	37,829
Grinding Machines, N.E.C.	926	86,945	16,540	68,645	2,534	23,695
Center Lathes	3,926	66,330	346	7,987	1,562	10,064
Automatic Lathes	3,652	95,360	885	20,004	70	2,279
Vertical Lathes, NC	665	78,584	8,673	642,766	56	16,342
Horizontal Lathes, NC	15,323	1,002,884				
Lathes, N.E.C.	1,898	25,837	1,620	9,275	142	1,673
Knee Type Milling Machines	3,081	65,980	235	5,412	189	1,851
Bed Type Milling Machines	1,306	43,378	—	—	—	—
Copy Milling Machines	547	22,537	171	3,151	297	599
Milling Machines, NC	1,977	166,603	462	71,873	64	3,982
Milling Machines, N.E.C.	347	8,723	2,571	18,253	573	4,765
Machining Centers, Vertical	6,822	606,249	5,893	703,857	—	—
Machining Centers, Horizontal	2,742	512,895			—	—
Machining Centers, N.E.C.	1,318	236,227			—	—
Electrical Discharge Machines, NC	5,240	492,493	—	—	96	8,877
Electrical Discharge Machines, N.E.C.	413	21,351	—	—	—	—
Special Purpose Machines, NC	1,450	236,393	—	—	—	—
Special Purpose Machines, N.E.C.	2,957	435,604	—	—	—	—
Other Metal Cutting Machines, NC	679	55,240	—	—	76	5,341
All Other Metal Cutting Machines, N.E.C.	43,340	175,849	385,305	270,947	2,039	14,823

Exchange rate: $1 = 168.52 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine, For Selected Destinations, 1986
(Values in Thousands of U.S. Dollars)

Type of Machine	Destination									
	U.S.A.	West Germany	Belgium	United Kingdom	Australia	U.S.S.R.	Korea	People's Rep. of China	India	Taiwan
GRAND TOTAL										
UNITS	269,682	4,896	2,627	7,464	21,048	303	3,082	2,285	375	8,635
VALUE	$859,299	$184,257	$110,159	$78,554	$63,541	$39,568	$178,483	$157,803	$49,858	$45,911
Boring Machines										
Units	62	3	—	4	35	11	72	63	26	5
Value	$ 9,340	$ 439	—	$ 854	$ 8,765	$ 1,567	$ 13,886	$ 9,299	$ 8,492	$ 457
Drilling Machines										
Units	2,101	479	75	523	283	15	517	324	53	277
Value	$ 13,174	$ 6,017	$ 261	$ 1,282	$10,925	$ 611	$ 12,224	$ 31,320	$ 8,207	$ 1,406
Gear Cutting & Finishing										
Units	7	—	—	—	2	5	100	10	6	34
Value	$ 789	—	—	—	$ 6	$ 220	$ 12,948	$ 398	$ 220	$ 688
Grinding Machines										
Units	7,479	86	200	1,287	109	113	494	643	60	441
Value	$ 35,420	$ 1,733	$ 6	$ 6,658	$ 2,415	$14,521	$ 56,094	$ 57,020	$ 6,029	$12,817
Lathes										
Units	4,579	2,011	729	512	206	54	419	145	126	229
Value	$309,299	$ 69,078	$ 56,545	$32,020	$16,026	$ 4,551	$ 25,967	$ 11,565	$12,390	$ 7,904
Milling Machines										
Units	2,423	99	—	46	128	12	146	68	26	122
Value	$ 15,553	$ 3,614	—	$ 3,121	$ 8,082	$ 3,887	$ 22,365	$ 12,272	$ 4,439	$ 5,756
Planing Machines										
Units	2	—	—	—	1	—	1	2	1	—
Value	$ 1,442	—	—	—	$ 30	—	$ 220	$ 2	$ 564	—
Machining Centers										
Units	3,435	602	386	234	103	41	42	96	29	35
Value	$363,435	$ 65,974	$ 52,492	$27,522	$12,455	$ 9,204	$ 11,138	$ 21,920	$ 6,836	$ 4,338
Other Metal Cutting Machines										
Units	249,604	1,616	1,237	4,858	20,179	52	1,291	934	48	7,492
Value	$110,853	$ 37,402	$ 854	$ 7,103	$ 4,830	$ 5,008	$ 23,653	$ 14,010	$ 2,688	$12,533

Exchange Rate: $1 = 168.52 Yen.

Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1980 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1980	1981	1982	1983	1984	1985	1986
GRAND TOTAL							
Units	22,069	25,926	24,048	26,398	38,024	44,964	38,822
Value	$1,496,512	$1,967,642	$1,687,203	$1,794,548	$2,482,886	$2,947,296	$3,626,715
Boring Machines							
Units	103	135	134	140	215	168	208
Value	$ 35,652	$ 57,298	$ 44,529	$ 42,236	$ 43,499	$ 38,425	$ 65,512
Drilling Machines							
Units	249	301	201	501	631	633	1,339
Value	$ 8,710	$ 9,781	$ 7,380	$ 17,817	$ 20,470	$ 19,125	$ 42,155
Milling Machines							
Units	1,451	2,381	2,308	2,467	2,775	2,664	1,977
Value	$ 83,215	$ 136,430	$ 134,403	$ 141,824	$ 146,779	$ 160,837	$ 166,603
Grinding Machines							
Units	154	235	296	338	674	1,049	1,059
Value	$ 15,078	$ 19,653	$ 24,035	$ 24,225	$ 49,575	$ 78,012	$ 131,474
Lathes							
Units	12,036	12,134	10,298	10,020	16,550	19,084	15,986
Value	$ 672,891	$ 731,755	$ 560,823	$ 511,309	$ 811,515	$ 926,381	$1,081,474
Special Machines							
Units	101	103	137	497	1,193	1,529	1,450
Value	$ 28,370	$ 53,149	$ 39,795	$ 62,799	$ 129,383	$ 187,335	$ 236,393
Elec. Discharge Machines							
Units	2,554	3,020	3,522	4,187	5,034	5,829	5,240
Value	$ 143,541	$ 180,846	$ 196,932	$ 254,130	$ 314,858	$ 375,803	$ 492,493
Machining Centers							
Units	5,231	7,393	6,936	7,833	10,252	13,345	10,882
Value	$ 491,383	$ 749,644	$ 649,219	$ 702,913	$ 896,994	$1,120,600	$1,355,358
Other NC Metal Cutting Machines							
Units	190	224	216	415	700	663	679
Value	$ 17,671	$ 27,085	$ 30,086	$ 37,294	$ 69,813	$ 40,777	$ 55,240

Exchange rate: 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen; 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1986

(Values in Thousands of U.S. Dollars)

	Exports to U.S.		Imports from U.S.	
Type of Machine	Units	Value	Units	Value
Boring Machines	36	$ 6,403	—	—
Drilling Machines	303	10,183	—	—
Grinding Machines	129	16,146	29	$7,281
Lathes	4,456	302,884	11	2,202
Milling	106	13,797	9	451
Machines Centers	3,435	363,435	—	—
Other	—	—	39	955

Exchange rate: $1 = 168.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF MACHINE TOOLS
Metal Cutting and Metal Forming, 1984 to Date
(Values in Thousands of U.S. Dollars)

	1984		1985		1986	
Destination	Units	Value	Units	Value	Units	Value
TOTAL CUTTING	364,480	$1,319,901	342,371	$1,656,074	433,243	$2,157,643
North & South America						
Brazil	141	$ 2,964	103	$ 2,020	148	$ 6,747
Canada	26,206	22,348	4,129	35,340	47,640	33,848
Mexico	253	26,166	358	5,928	185	5,875
U.S.A.	189,778	601,436	142,446	708,816	269,692	859,299
Western Europe						
Belgium	1,646	37,231	2,636	61,059	2,627	110,159
France	2,727	13,557	2,828	23,694	5,244	29,859
Netherlands	1,328	7,267	1,799	12,786	1,867	16,354
Norway	482	2,631	930	5,265	903	7,940
Sweden	987	16,891	1,439	25,941	1,198	35,474
United Kingdom	6,179	51,983	6,360	62,283	7,464	78,554
West Germany	3,516	66,618	5,075	118,810	4,896	184,257
Eastern Europe						
Poland	8	1,124	5	1,010	15	3,103
Romania	—	—	2	126	—	—
U.S.S.R.	442	45,158	468	70,793	303	39,568
Asia						
Burma	160	480	163	797	85	1,252
China	3,857	16,146	16,367	72,151	2,285	157,803
Korea	1,886	69,224	2,292	117,683	3,082	178,483
Philippines	371	1,692	237	1,035	1,833	3,525
Singapore	11,786	32,780	4,248	20,978	4,999	22,769
Taiwan	11,150	51,410	8,432	34,527	8,635	45,911
Thailand	5,438	24,217	5,177	19,536	2,023	11,079
All Other Countries						
Australia	30,307	37,264	36,885	56,284	21,048	63,541
South Africa	6,056	17,055	2,405	6,636	1,660	4,818
All Other Countries	59,776	174,259	97,587	192,567	45,411	257,425
TOTAL FORMING	32,788	$ 421,106	29,773	$ 522,902	27,790	$ 905,809
North America						
Canada	99	$ 1,511	136	$ 5,236	265	$ 82,809
Mexico	102	1,634	113	16,563	78	6,272
U.S.A	8,869	139,222	6,583	131,525	10,345	451,371
Western Europe						
France	61	623	48	1,861	129	6,539
Italy	248	1,351	50	1,488	147	2,949
Switzerland	109	530	181	880	226	1,098
United Kingdom	625	8,387	1,014	6,837	711	10,230
West Germany	1,840	11,885	1,550	18,144	1,033	26,305
Eastern Europe						
U.S.S.R.	183	14,491	111	55,479	27	20,472
Asia						
China	928	25,787	2,042	73,338	1,547	103,970
Indonesia	2,232	13,089	2,078	5,697	1,150	6,812
Korea	1,594	36,751	1,329	69,640	1,168	53,893
Malaysia	1,079	29,669	739	20,999	234	6,569
Singapore	2,085	14,209	904	9,810	722	14,040
Taiwan	1,653	27,577	1,144	18,684	1,479	27,510
All Other Countries	11,061	94,388	11,751	86,719	8,531	84,969

Exchange rate: 1984 $1 = 237.52 Yen; 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen.

Sources: Japan, Ministry of Finance and Ministry of International Trade and Industry.

JAPANESE IMPORTS OF MACHINE TOOLS
Metal Cutting and Metal Forming, 1984 to Date
(Values in Thousands of U.S. Dollars)

	1984		1985		1986	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL CUTTING	18,811	$123,185	15,019	$147,506	15,851	$197,253
United States	1,200	$ 18,630	1,221	$ 21,674	1,240	$ 31,622
Western Europe						
Austria	125	105	172	277	197	356
France	656	951	494	683	361	1,430
Italy	96	2,349	181	3,664	377	3,566
Sweden	102	564	84	1,899	79	807
Switzerland	893	40,359	1,144	51,245	665	51,667
United Kingdom	234	1,890	335	2,960	344	3,810
West Germany	861	25,122	940	31,148	902	68,633
Eastern Europe						
Czechoslovakia	46	1,718	7	398	10	356
East Germany	31	2,324	32	4,083	30	3,643
Poland	—	—	—	—	2	47
U.S.S.R.	124	3,532	145	4,607	263	4,890
Asia						
Singapore	948	9,229	940	8,732	620	6,189
Taiwan	12,367	6,012	8,434	6,875	9,664	8,996
Other Countries	1,128	10,399	890	9,261	1,097	11,239
TOTAL FORMING	3,305	$ 58,648	2,628	$ 71,451	2,992	$ 75,047
United States	1,971	$ 21,842	1,353	$ 20,546	1,525	$ 24,958
Western Europe						
Switzerland	361	12,896	224	17,477	251	11,732
West Germany	192	16,491	191	22,961	185	24,780
Other Countries	781	7,418	860	10,468	1,031	13,577

Exchange rate: 1984 $1 = 237.52 Yen; 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1986
(Values in Thousands of U.S. Dollars)

Type of Machine	Country of Origin									
	U.S.A.	West Germany	Switzerland	Singapore	Korea	Taiwan	France	United Kingdom	East Germany	U.S.S.R.
GRAND TOTAL										
UNITS	1,240	902	665	620	606	9,664	377	344	30	263
VALUE	$31,622	$68,633	$51,667	$6,189	$3,501	$8,996	$3,566	$3,810	$3,643	$4,890
Boring Machines										
Units	1	3	19	—	—	1	—	1	2	4
Value	$ 344	$ 558	$ 3,738	—	—	$ 18	—	$ 65	$ 220	$ 415
Drilling Machines										
Units	264	51	2	—	26	6,445	1	—	—	19
Value	$ 237	$ 463	$ 237	—	$ 249	$ 825	$ 356	—	—	$ 356
Gear Cutting and Finishing										
Units	43	19	79	—	1	2	—	3	6	7
Value	$ 9,471	$ 5,845	$10,355	—	$ 59	$ 36	—	$ 202	$1,050	$ 392
Grinding Machines										
Units	556	387	217	552	26	1,376	35	255	16	40
Value	$14,515	$37,527	$19,576	$5,471	$ 303	$1,377	$2,202	$1,792	$2,207	$ 593
Lathes										
Units	46	51	39	1	315	875	7	63	5	110
Value	$ 3,602	$14,117	$ 1,484	$ 18	$2,362	$4,510	$ 131	$ 113	$ 71	$ 599
Milling Machines										
Units	35	61	8	65	33	505	9	7	—	69
Value	$ 576	$ 3,572	$ 469	$ 688	$ 356	$1,501	$ 172	$ 694	—	$2,172
Planing Machines										
Units	—	9	—	—	—	1	—	—	—	2
Value	—	$ 6	—	—	—	$ 65	—	—	—	$ 184
Other Metal Cutting Machines										
Units	295	321	301	2	205	459	325	15	1	12
Value	$ 2,878	$ 6,539	$15,802	$ 12	$ 172	$ 676	$ 700	$ 932	$ 95	$ 178

Note: Individual items may not add to totals due to rounding.

Exchange rate: $1 = 168.52 Yen.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS

1964 to Date

(Millions of Dollars)

	Net New Orders			Shipments			Unfilled
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Orders
1964	$ 388.4	$282.0	$106.5	$ 339.5	$234.1	$105.4	$241.5
1965	442.0	322.0	120.0	395.9	272.9	123.0	292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979	1,260.3	771.6	488.7	1,205.9	793.6	412.3	742.7
1980	1,038.8	562.3	476.5	1,370.6	813.9	556.7	418.7
1981(r)	865.3	273.2	592.1	903.2	498.5	404.7	304.2
1982(r)	576.8	327.0	249.8	736.6	414.0	349.6	157.5
1983(r)	471.7	259.7	212.0	544.0	318.5	225.5	NA
1984(r)	535.5	284.3	251.2	519.6	303.3	216.3	NA
1985(r)	618.3	321.8	296.5	580.4	316.9	263.5	NA
1986(p)	729.2	325.3	403.9	749.8	411.8	338.0	NA

NA - Not Available. p - Preliminary. r - Revised.

Note: Net new orders and shipments beginning in 1986 are estimated from a larger sampling of firms and, consequently, are reflected in higher figures.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

Number of Employees, 1967 to Date

Mid-Year	Employees	Mid – Year	Employees
1967	65,500	1977	47,675
1968	63,600	1978	48,500
1969	63,700	1979	48,350
1970	65,100	1980	46,350
1971	59,000	1981	40,500
1972	50,100	1982(r)	30,300
1973	48,400	1983(r)	26,400
1974	50,000	1984(r)	23,300
1975	49,100	1985(r)	24,100
1976	47,050	1986(p)	23,900

p - Preliminary. r - Revised.

Note: Data from 1982 forward relates to Great Britain only.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, Units and Value, 1985 and 1986

(Values in Thousands of U.S. Dollars)

Type of Machine	1985 (r)		1986	
	Units	Value	Units	Value
TOTAL (excluding parts)	NA	$184,723	NA	$247,630
Drilling Machines				
Boring Machines	1,050E	41,222	NA	51,785
Milling Machines				
Machining Centers - Horizontal	149	26,185	158	33,301
Machining Centers - Vertical	480	38,500	912	68,802
Machining Centers (manual tool change) and Indexing Turret	(a)	(a)	(a)	(a)
Lathes	917	42,130	884	49,878
Other Numerically Controlled Machines	438	36,685	366	44,010

r – Revised. E – Estimate. NA – Not Available.

Exchange Rate: 1985 1 Pound = $1.2963; 1986 1 Pound = $1.467.

(a) "Machining Centers (manual tool change) and Indexing Turret" are included with Drilling, Boring, and Milling Machines.

Note: Individual items may not add to totals due to rounding.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

1970 to Date

(Values in Thousands of Dollars)

Year	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
	Units	Value	Units	Value	Units	Value	Units	Value
1970(a)	725	$ 52,561	350	$ 26,978	600	$ 37,773	241	$ 15,848
1971	343	26,320	156	12,842	590	44,591	280	23,023
1972	548	42,199	189	14,551	381	27,173	150	12,735
1973	634	44,562	238	18,884	462	30,379	178	13,255
1974	739	65,520	353	32,362	709	37,452	246	15,171
1975	283	28,833	70	8,610	739	52,719	271	20,898
1976	535	57,429	157	17,820	612	48,635	192	17,598
1977	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978	681	105,986	209	26,135	969	102,376	245	29,086
1979	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980	978	160,736	397	60,193	1,240	198,985	421	54,712
1981	1,237	192,812	398	75,702	1,196	165,037	399	56,167
1982	1,370	124,583	NA	35,280	1,510	173,718	424	74,738
1983	2,010	125,721	NA	42,646	1,825	130,767	489	43,804
1984	NA	152,698	NA	64,093	NA	157,594	815	51,033
1985(r)	NA	219,075	NA	100,982	NA	184,723	NA	79,074
1986(p)	NA	298,241	NA	169,585	NA	247,630	NA	120,881

NA - Not Available. p - Preliminary. r - Revised.

(a) Includes parts.
(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trades Association, and United Kingdom, Department of Trade and Industry.

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UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1985 and 1986

(Values in Thousands of U.S. Dollars)

Type of Machine	1985 (r)		1986	
	Units	Value	Units	Value
TOTAL	—	$264,704	—	$329,048
Boring Machines				
Fine	NA	2,722	91	5,721
Horizontal				
Jig, Vertical and Other	—	—	—	—
Drilling Machines				
Vertical	755E	2,074	638	3,814
Radial and Other	33	1,037		
Gear Cutting and Finishing Machines)	(c)	(c)	(c)	(c)
Grinding and Polishing Machines				
Cylindrical—External	266	13,222	272	20,245
Cylindrical—Universal				
Cylindrical—Internal	1,021	12,444	8	567
Surface			NA	10,856
Tool and Cutter			331	4,988
Other Grinding	197	4,407	(e)	(e)
Honing and Lapping	687	6,870	1,341	15,257
Lathes				
Automatic (excl. plugboard)	5,862	42,908	6,550	49,585
Center	146	4,148	118	6,455
Plugboard				
Other				
Milling Machines				
Knee and Column	1,574	15,944	1,316	16,577
Bed Type	24	1,556	26	1,174
Other	131	1,037	105	1,027
Other Metal Cutting				
Transfer, Single Station and Unit Head Machines	156	20,611	144	31,687
Sawing and Cut-Off	6,085E	10,889	5,560	14,230
Screwing and Threading				
Other Metal Cutting, N.E.C.	204E	12,963	172	11,736
Parts for Metal Cutting Machine Tools	—	111,223	—	132,164(d)

NA - Not Available. r - Revised. E - Estimate.

(a) Excludes numerically controlled machines.
(b) Includes cam shaft, cam, spline, jig, profile, swing frame, billet, cone centre and rack track.
(c) Included in "Other Metal Cutting, N.E.C."
(d) Includes electrical discharge machines.
(e) Included in "Honing and Lapping."

Note: Individual items may not add to totals due to rounding.

Exchange Rate: 1985 1 Pound = $1.2963; 1986: 1 Pound = $1.3363.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1985 and 1986

(Values in Thousands of U.S. Dollars)

Type of Machine	1985		1986(c)	
	Units	Value	Units	Value
TOTAL	—	$108,241	—	$127,189
Presses				
Hydraulic—Open Front	(b)	(b)	265	6,455
Hydraulic—Straight, Extrusion & Other	(b)	(b)	(b)	(b)
Mechanical—Open Front	133	2,463	163	5,721
Mechanical—Straight Sided	(b)	(b)	(b)	(b)
Other Mechanical	(b)	(b)	(b)	(b)
Forging Machines	NA	(b)	829E	7,775
Shearing Machines	(b)	(b)	(b)	(b)
Plate & Sheet Bending & Forming	(b)	(b)	(b)	(b)
Bar, Tube & Section Drawing & Forming	487	10,325	461	14,377
Wire and Strip Drawing & Forming	195	4,770	144	3,521
Other Bending & Working incl. Sheet Metal	(b)	(b)	(b)	(b)
Riveting and Other Metal Forming	1,504	58,852	958	57,947
Parts for Metal Forming Machine Tools	—	28,648	—	37,995

E – Estimate.

Exchange Rate: 1985: 1 Pound = $1.2963: 1986: 1 Pound = $1.4647.

(a) Excludes numerically controlled machines.
(b) Included in "Riveting and Other Metal Forming."
(c) Data in 1986 taken from a larger industry sampling which is reflected in higher figures.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS

New and Used, For Selected Countries, 1986

(Values in U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$164,532,110	United States	$94,496,312	Denmark	$4,548,855
Japan	107,210,273	West Germany	44,949,411	Japan	4,323,300
U.S.A.	74,040,383	France	27,540,852	Turkey	4,288,148
Switzerland	45,737,918	China	18,188,660	South Korea	4,234,080
Italy	33,771,005	Canada	17,190,300	South Africa	4,219,632
Canada	29,678,484	Italy	15,951,750	Israel	3,968,198
Sweden	18,551,364	India	12,995,073	Pakistan	3,632,704
France	12,874,427	Australia	11,649,601	Nigeria	3,229,618
Spain	12,662,509	Sweden	10,651,535	U.S.S.R.	3,184,484
Taiwan	10,682,675	Switzerland	10,533,229	Norway	3,015,482
United Kingdom	9,048,572	Netherlands	10,194,083	Saudi Arabia	2,827,487
Netherlands	6,228,272	Irish Republic	8,732,212	Iran	2,750,125
Belgium-Lux.	5,610,657	Belgium-Lux.	7,622,997	Austria	2,627,244
Austria	4,805,226	Spain	6,061,396	Egypt	2,508,504
East Germany	3,781,272	Finland	4,762,413	New Zealand	2,429,295

Exchange Rate: 1 Pound = $1.467.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1985

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total World	United States	West Germany	Canada	France	China (PRC)	India	Australia
Grand Total (incl. N/C)								
Units	24,972	5,112	1,499	1,407	1,024	111	551	841
Value	$322,040	$81,221	$31,802	$15,124	$16,605	$13,770	$10,838	$9,112
Boring (incl. N/C)								
Units	443	56	26	20	13	1	9	3
Value	$ 18,092	$ 3,882	$ 1,822	$ 1,920	$ 412	$ 38	$ 1,146	$ 47
Boring, N/C								
Units	63	14	10	5	1	—	3	—
Value	$ 11,773	$ 2,541	$ 1,601	$ 1,258	$ 271	—	$ 744	—
Drilling (incl. N/C)								
Units	696	53	71	15	47	—	13	29
Value	$ 7,030	$ 920	$ 1,695	$ 114	$ 513	—	$ 323	$ 113
Drilling, N/C								
Units	39	8	6	—	—	—	1	—
Value	$ 3,218	$ 481	$ 1,279	—	—	—	$ 87	—
Gear Cutting & Finishing (incl. N/C)								
Units	48	12	1	5	—	5	7	—
Value	$ 3,113	$ 1,052	$ 115	$ 332	—	$ 575	$ 196	—
Gear Cutting & Finishing, N/C								
Units	5	—	—	—	—	—	—	—
Value	$ 224	—	—	—	—	—	—	—
Grinding & Polishing(incl. N/C)								
Units	4,472	1,160	245	466	215	23	126	87
Value	$ 49,180	$13,236	$ 5,893	$ 1,647	$ 1,873	$ 761	$ 2,389	$ 677
Grinding & Polishing, N/C								
Units	55	12	13	—	—	—	2	—
Value	$ 8,410	$ 1,902	$ 2,441	—	—	—	$ 460	—
Lathes (incl. N/C)								
Units	3,889	969	376	240	204	7	22	273
Value	$ 56,538	$17,572	$ 5,560	$ 1,949	$ 4,928	$ 967	$ 1,147	$2,544
Lathes, N/C								
Units	324	104	21	7	26	3	3	2
Value	$ 14,176	$ 3,811	$ 1,960	$ 164	$ 2,087	$ 776	$ 345	$ 139
Milling (incl. N/C)								
Units	1,218	195	43	133	44	11	7	21
Value	$ 33,230	$ 7,944	$ 1,972	$ 1,427	$ 1,534	$ 1,342	$ 300	$ 344
Milling, N/C								
Units	335	132	19	6	17	8	1	4
Value	$ 16,610	$ 5,445	$ 1,298	$ 238	$ 924	$ 1,255	$ 26	$ 143
Other Metal Cutting								
Units	2,992	957	195	194	86	9	11	118
Value	$ 50,955	$13,710	$ 8,084	$ 1,937	$ 2,577	$ 3,160	$ 1,589	$ 788
Total Metal Forming								
Units	11,214	1,710	542	334	415	55	356	310
Value	$103,902	$22,905	$ 6,661	$ 5,798	$ 4,768	$ 6,927	$ 3,748	$4,599

Exchange Rate: 1 Pound = $1.2963.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1986

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	China	France	Italy	India	Canada
Grand Total (incl. N/C)								
Units	21,751	4,233	2,389	152	1,134	872	375	965
Value	$377,548	$91,270	$43,555	$18,040	$26,890	$14,251	$12,814	$15,689
Boring (incl. N/C)								
Units	516	131	56	26	26	29	20	18
Value	$ 22,278	$ 3,494	$ 3,639	$ 1,629	$ 2,568	$ 314	$ 2,175	$ 1,162
Boring, N/C								
Units	59	10	14	2	8	1	5	2
Value	$ 12,900	$ 1,956	$ 2,852	$ 486	$ 2,294	$ 169	$ 1,700	$ 602
Drilling (incl, N/C)								
Units	970	52	69	3	101	12	20	5
Value	$ 6,423	$ 1,074	$ 420	$ 39	$ 184	$ 255	$ 174	$ 83
Drilling, N/C								
Units	22	5	3	—	—	—	1	1
Value	$ 1,973	$ 446	$ 244	—	—	—	$ 86	$ 59
Gear Cutting & Finishing (incl. N/C)								
Units	129	20	17	2	—	11	30	3
Value	$ 3,263	$ 831	$ 681	$ 401	—	$ 123	$ 94	$ 134
Gear Cutting & Finishing, NC								
Units	17	—	1	2	—	—	13	—
Value	$ 736	—	$ 118	$ 401	—	—	$ 44	—
Grinding & Polishing (incl. N/C)								
Units	3,326	708	317	28	201	124	98	104
Value	$ 55,841	$18,246	$ 5,208	$ 1,159	$ 3,813	$ 1,632	$ 1,668	$ 1,168
Grinding & Polishing, NC								
Units	49	13	9	1	1	1	1	—
Value	$ 12,978	$ 3,962	$ 1,941	$ 106	$ 453	$ 165	$ 222	—
Lathes (incl. N/C)								
Units	4,043	972	537	18	230	120	21	192
Value	$ 73,149	$21,495	$ 9,824	$ 1,090	$ 5,029	$ 3,229	$ 2,386	$ 1,994
Lathes, N/C								
Units	217	62	25	9	26	12	13	2
Value	$ 20,996	$ 5,215	$ 2,961	$ 758	$ 2,123	$ 1,233	$ 1,950	$ 128
Milling (incl. N/C)								
Units	1,111	244	70	11	64	136	27	70
Value	$ 38,462	$11,423	$ 2,885	$ 1,644	$ 1,646	$ 3,782	$ 1,299	$ 1,383
Milling, N/C								
Units	438	179	34	2	17	18	5	10
Value	$ 24,644	$ 9,015	$ 2,141	$ 64	$ 1,161	$ 1,296	$ 862	$ 914
Other Metal Cutting								
Units	3,190	905	332	21	189	101	85	302
Value	$ 74,955	$12,517	$12,045	$ 3,783	$ 8,667	$ 2,464	$ 2,830	$ 2,409
Total Metal Forming								
Units	8,464	1,201	991	43	323	339	74	271
Value	$103,177	$22,190	$ 8,853	$ 8,295	$ 4,981	$ 2,432	$ 2,188	$ 7,356

Exchange Rate: 1 Pound = $1.467.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1985

By Type of Machine, Total and N/C; Total & Major Countries of Origin

(Values in Thousands of U.S. Dollars)

Type of Machine	Total World	West Germany	Japan	United States	Switzerland	Italy	France	Sweden
Grand Total (incl. N/C)								
Units	79,707	18,872	3,065	3,088	1,052	6,359	3,698	670
Value	$386,057	$107,881	$87,435	$51,069	$33,714	$27,088	$10,253	$10,899
Boring (incl. N/C)								
Units	416	185	45	16	31	9	4	6
Value	$ 21,253	$ 10,285	$ 3,292	$ 1,108	$ 3,267	$ 933	$ 538	$ 272
Boring, N/C								
Units	101	47	41	3	3	3	—	3
Value	$ 15,253	$ 7,657	$ 3,046	$ 870	$ 2,152	$ 755	—	$ 268
Drilling (incl, N/C)								
Units	6,287	158	42	110	20	62	62	48
Value	$ 10,519	$ 2,590	$ 468	$ 2,901	$ 1,350	$ 315	$ 451	$ 156
Drilling, N/C								
Units	2	—	—	—	—	—	1	—
Value	$ 146	—	—	—	—	—	$ 106	—
Gear Cutting & Finishing (incl. N/C)								
Units	105	16	—	44	6	5	2	20
Value	$ 10,289	$ 1,902	—	$ 5,611	$ 785	$ 1,104	$ 79	$ 5
Gear Cutting & Finishing, N/C								
Units	22	6	—	9	3	1	—	—
Value	$ 4,876	$ 1,462	—	$ 2,397	$ 537	$ 215	—	—
Grinding & Polishing (incl. N/C)								
Units	41,482	10,778	678	627	112	1,212	152	265
Value	$ 45,764	$ 14,861	$ 3,711	$ 8,627	$ 5,871	$ 3,198	$ 714	$ 1,438
Grinding & Polishing, N/C								
Units	1,091	42	3	12	17	5	1	3
Value	$ 13,065	$ 6,592	$ 405	$ 2,055	$ 1,873	$ 526	$ 268	$ 274
Lathes (incl. N/C)								
Units	2,464	378	640	170	107	74	21	54
Value	$ 90,061	$ 23,349	$34,437	$11,446	$ 4,590	$ 2,720	$ 570	$ 2,841
Lathes, N/C								
Units	1,130	231	622	95	17	19	4	26
Value	$ 74,915	$ 18,365	$33,956	$10,194	$ 2,454	$ 1,381	$ 185	$ 2,750
Milling (incl. N/C)								
Units	1,447	171	27	28	15	72	73	28
Value	$ 19,642	$ 5,847	$ 1,485	$ 646	$ 1,923	$ 1,631	$ 1,876	$ 172
Milling, N/C								
Unit	142	50	27	11	7	10	21	—
Value	$ 11,011	$ 4,021	$ 1,485	$ 528	$ 1,728	$ 856	$ 1,531	—
Other Metal Cutting								
Units	11,288	1,381	1,241	357	195	3,527	211	74
Value	$ 88,237	$ 20,892	$34,211	$ 9,529	$ 5,056	$ 6,375	$ 489	$ 1,543
Total Metal Forming								
Units	16,218	5,805	392	1,736	566	1,398	3,173	175
Value	$100,292	$ 28,155	$ 9,831	$11,201	$10,872	$10,812	$ 5,536	$ 4,472

Exchange Rate: 1 Pound = $1.2963.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1986

By Type of Machine, Total and N/C; Total & Major Countries of Origin

(Values in Thousands of U.S. Dollars)

Type of Machine	Total World	West Germany	United States	Japan	Switzerland	Italy	Canada	Sweden
Grand Total (incl. N/C)								
Units	90,052	11,738	2,263	4,095	912	8,377	132	1,262
Value	$546,869	$162,278	$70,612	$106,191	$45,432	$33,400	$29,676	$18,484
Boring (incl. N/C)								
Units	580	120	41	51	43	89	—	3
Value	$ 32,992	$ 11,270	$ 2,169	$ 8,391	$ 3,532	$ 2,677	—	$ 38
Boring, N/C								
Units	116	41	10	33	9	14	—	—
Value	$ 24,029	$ 8,771	$ 1,384	$ 7,203	$ 2,945	$ 1,520	—	—
Drilling (incl. N/C)								
Units	14,998	379	158	55	20	134	11	158
Value	$ 15,098	$ 5,517	$ 2,253	$ 609	$ 521	$ 491	$ 23	$ 188
Drilling, N/C								
Units	18	14	39	1	—	—	—	—
Value	$ 2,417	$ 1,847	$ 2,253	$ 33	—	—	—	—
Gear Cutting & Finishing (incl. N/C)								
Units	66	12	39	2	2	4	—	—
Value	$ 6,952	$ 2,305	$ 2,503	$ 447	$ 229	$ 877	—	—
Gear Cutting & Finishing, N/C								
Units	8	6	—	2	—	—	—	—
Value	$ 2,175	$ 1,728	—	$ 447	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	43,661	4,026	779	1,226	122	2,356	39	328
Value	$ 78,312	$ 31,561	$11,679	$ 4,474	$13,107	$ 4,238	$ 30	$ 3,511
Grinding & Polishing, N/C								
Units	871	31	17	15	9	10	—	5
Value	$ 19,326	$ 7,378	$ 2,795	$ 2,425	$ 2,219	$ 1,990	—	$ 1,394
Lathes, N/C)								
Units	3,180	388	206	490	62	230	1	343
Value	$114,099	$ 28,137	$16,906	$ 36,534	$ 3,752	$ 5,295	$ 2	$ 7,729
Lathes, N/C								
Units	1,149	108	132	471	11	22	—	31
Value	$ 91,620	$ 21,083	$16,296	$ 35,758	$ 1,768	$ 2,238	—	$ 6,150
Milling (incl. N/C)								
Units	1,628	274	21	47	22	49	13	28
Value	$ 30,236	$ 12,579	$ 921	$ 2,381	$ 1,033	$ 1,701	$ 11	$ 505
Milling, N/C								
Units	213	74	18	34	3	12	—	2
Value	$ 17,860	$ 9,615	$ 910	$ 2,150	$ 382	$ 981	—	$ 279
Other Metal Cutting								
Units	12,142	2,039	286	1,408	117	3,619	22	32
Value	$169,370	$ 41,082	$26,515	$ 41,669	$ 8,857	$ 9,063	$29,191	$ 343
Total Metal Forming								
Units	13,817	4,500	733	816	524	1,896	46	320
Value	$101,810	$ 29,827	$ 7,666	$ 11,686	$14,401	$ 9,058	$ 419	$ 6,173

Exchange Rate: 1 Pound = $1.467.

Source: The Department of Trade and Industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Type of Machine, Units and Value, 1984 to Date

(Thousands of U.S. Dollars)

	1984		1985		1986	
Type of Machine	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	13,057	$ 56,133	7,970	$ 58,895	29,855	$105,817
Metal Cutting Total	10,163	36,631	6,112	37,265	23,521	61,281
Lathes	309	6,593	299	8,596	644	14,789
Boring Machines	404	992	53	1,634	87	1,033
Milling Machines	620	2,710	808	3,149	246	3,137
Planing Machines	2	2	1	14	—	—
Broaching Machines	11	152	3	66	6	36
Drilling Machines	776	970	370	1,013	2,483	2,745
Grinding & Polishing Machines	7,077	13,641	3,242	12,296	16,096	13,671
Gear Cutting Machines	17	2,848	59	438	24	1,536
Other Metal Cutting	947	8,723	1,277	10,059	3,935	24,334
Metal Forming Total	2,894	19,502	1,856	21,630	6,334	44,536
Presses	157	3,231	203	4,709	363	9,093
Forging & Stamping Machines	14	379	24	1,700	33	7,454
Bending & Rolling Machines	356	2,799	351	2,889	568	6,911
Other Metal Forming	2,367	12,643	1,278	12,332	5,370	21,078
TOTAL EXPORTS	85,481	$113,261	22,823	$151,452	31,276	$178,681
Metal Cutting Total	32,883	85,164	13,953	116,693	12,279	142,506
Lathes	2,351	16,103	1,946	25,049	1,600	24,967
Boring Machines	123	5,108	171	7,645	85	9,067
Milling Machines	19,051	39,688	5,626	48,993	5,270	65,728
Planing Machines	41	163	—	—	5	46
Broaching Machines	6	33	10	147	10	110
Drilling Machines	2,241	5,432	2,085	8,411	1,763	7,395
Grinding & Polishing Machines	6,589	8,449	1,471	12,395	841	14,201
Gear Cutting Machines	8	150	16	290	9	116
Other Metal Cutting	2,473	10,038	2,628	13,763	2,696	20,876
Metal Forming Total	42,598	28,097	8,870	34,759	18,997	36,175
Presses	1,317	9,887	991	10,374	840	13,487
Forging & Stamping Machines	30	537	52	876	29	953
Bending & Rolling Machines	257	4,312	3,746	4,302	781	5,096
Other Metal Forming	40,994	13,361	4,081	19,207	17,347	16,639

Exchange Rate: 1984 $1 = 160.76 Pesetas, 1985 $1 = 170.04 Pesetas; 1986 $1 = 140.05 Pesetas.

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination, 1984 to Date (a)

(Thousands of U.S. Dollars)

Country	Imports 1984	Imports 1985	Imports 1986	Exports 1984	Exports 1985	Exports 1986
GRAND TOTAL	$56,133	$58,895	$105,817	$113,261	$151,452	$178,681
Australia	—	—	1	3,009	3,133	2,809
Belgium-Luxemburg	537	912	1,283	1,814	2,607	3,979
Canada	60	20	85	3,113	4,110	3,911
Colombia	—	—	—	1,905	2,049	3,702
Cuba	—	—	—	1,855	7,205	4,179
Denmark	224	411	794	1,064	1,579	2,910
Egypt	—	—	—	1,624	1,672	1,964
Finland	74	77	75	1,463	1,931	3,610
France	4,556	5,635	6,073	8,197	9,115	17,273
Hong Kong	2	1	4	1,323	2,344	2,937
India	—	—	—	2,817	2,494	1,551
Italy	8,796	9,098	19,148	2,397	3,631	6,536
Japan	3,207	5,851	15,667	7	57	54
Mexico	—	6	—	4,126	9,762	4,078
Morocco	—	—	8	713	2,334	1,640
Netherlands	1,119	139	439	2,521	4,703	7,490
Portugal	168	210	467	3,238	4,540	7,301
South Africa	—	—	1	3,096	5,294	1,288
Sweden	2,186	2,052	867	3,118	4,248	5,570
Switzerland	6,036	4,497	8,905	1,566	1,858	3,069
United Kingdom	3,712	4,752	6,775	6,626	10,051	12,618
U.S.A.	4,007	4,165	5,051	15,981	19,105	20,774
Venezuela	—	—	—	3,919	4,442	3,410
West Germany	19,023	17,529	34,134	15,706	19,893	31,926
All Other	2,426	3,540	6,020	22,043	23,295	24,102

Exchange Rate: 1984 $1 = 160.76 Pesetas; 1985 $1 = 170.04 Pesetas; 1986 $1 = 140.5 Pesetas.

(a) Countries without data are included in "All Other."

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramienta.

SPANISH MACHINE TOOL EMPLOYMENT AND CONSUMPTION

Employment in Thousands, Values in Thousands of Dollars

(1974 to Date)

Year	Shipments	Imports	Exports	Consumption	Employment
1974	$206,873	$135,009	$ 69,789	$272,093	12.2
1975	223,117	168,693	86,532	305,277	11.6
1976	183,600	132,679	90,811	225,468	11.0
1977	190,872	91,373	102,529	179,716	10.5
1978	232,185	90,072	147,579	176,823	10.3
1979	315,829	91,322	210,766	196,385	10.0
1980	352,849	103,196	228,268	227,777	9.5
1981	319,957	142,038	207,038	254,957	8.8
1982	260,226	176,697	175,525	261,398	8.5
1983	188,245	86,244	99,427	175,063	7.6
1984	211,495	56,133	113,261	154,364	7.4
1985	252,881	58,895	151,452	160,324	7.3
1986	396,287	105,817	178,681	323,423	7.5

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramienta.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS

By Type of Machine, Units and Value, 1984 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1984 Units	1984 Value	1985 Units	1985 Value	1986 Units	1986 Value
Engine & Turret Lathes, NC	323	$ 23,486	388	$ 27,207	435	$ 50,005
Vertical Boring & Turning Mills, NC	(e)	(e)	(a)	(a)	(a)	(a)
Turning Centers, NC	110	10,494	102	5,826	78	6,757
Other Lathes, NC	183(e)	30,395(e)	(a)	(a)	155(e)	39,626(e)
Engine Lathes, non-NC	338	5,354	518	10,556	580	13,038
Copying, Multi-Tool & Semi-Automatic Turret Lathes, non-NC	28	1,127	(a)	(a)	(a)	(a)
Single-Spindle Automatic Lathes, non-NC	55(b)	1,224(b)	82	1,738	36	1,092
Other Lathes, non-NC	40	821	(a)	(a)	25	1,633
Comb. Boring & Milling Machines, NC	7	2,759	8	6,727	(a)	(a)
Comb. Boring & Milling Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Boring Machines, NC	—	—	—	—	—	—
Boring Machines, non-NC	18	782	17	735	(a)	(a)
Milling Machines, NC	334	48,221	303	41,233	369(c)	70,141(c)
Knee-Type Milling Machines, non-NC	533	12,146	675	11,470	454	12,911
Bed-Type Milling Machines, non-NC	150	4,675	99	3,928	63	2,523
Other Milling Machines, non-NC	648	3,445	357	2,307	506	6,299
Drilling Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Comb. Drilling & Boring Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Radial Drilling Machines, non-NC	55	463	69	659	81	902
Bench Type Drilling Machines, non-NC	1,828	1,329	2,216	1,794	2,301	2,932
Pillar Type Drilling Machines, non-NC	1,072	1,073	(a)	(a)	(a)	(a)
Column Type Drilling Machines, non-NC	37	1,028	17	117	(a)	(a)
Grinding Machines, NC	46	3,260	16	2,523	13	2,710
Universal Tool & Cutter Grinding Machines, non-NC Single Point Cutting Tool Sharpening Machines, non-NC Cutter Sharpening Machines, non-NC Other Tool & Cutter Grinding Machines, non-NC	6,102	3,955	2,772	3,130	3,127	4,295
Universal Cylindrical Grinding Machines, non-NC	14	304	21	608	37	1,457
Internal Cylindrical Grinding Machines, non-NC External Cylindrical Grinding Machines, non-NC Surface Grinding Machines, non-NC Other Grinding Machines, non-NC	183	6,344	350	11,011	425	2,710
Screw Cutting Machines, non-NC	(a)	(a)	(a)	(a)	—	—
Tapping Machines, non-NC	185	246	196	322	219	421
Planing Machines, non-NC	—	—	—	—	—	—
Slotting & Shaping Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Surfacing Machines, non-NC	8,884	1,701	8,879	2,091	8,775	2,625
Polishing, Honing & Lapping Machines, non-NC	554	2,287	230	2,340	211	3,180
Broaching Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Gear Cutting Machines, non-NC	(a)	(a)	—	—	—	—
Sawing & Cut-Off Machines, non-NC	829	1,996	895	2,724	738	3,345
Band Sawing Machines, non-NC	183	1,276	294	1,997	330	2,766
Other Sawing or Cut-Off Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Spark Erosion Machines, non-NC	35	388	215	2,136	310	4,974
Transfer Lines	208	71,915	260	92,215	157	65,214
Unit Heads	438	1,325	642	3,950	586	2,584
Machining Centers	167	25,763	239	38,991	263	44,696
Other Metal Cutting Machines, NC	14	1,976	51	18,074	220	43,438
Other Metal Cutting Machines, non-NC	13,485	23,834	13,266	14,382	9,801	35,463
Total Metal Cutting, NC	1,283(d)	208,207(d)	1,365(f)	247,076(f)	1,876	334,041
TOTAL METAL CUTTING	38,682(d)	299,693(d)	36,690(f)	353,816(f)	32,918	471,304

Exchange Rate: 1984 $1 = 8.7391 Francs 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

(a) Data withheld.
(b) Includes "Multi - Spindle Automatic Lathes, Non-NC."
(c) Does not include "Other Milling Machines, NC."
(d) Does not include "Spark Erosion Machines, NC."
(e) "Vertical Boring & Turning Mills, NC" are includes in "Other Lathes, NC."
(f) Does not include "Copying Lathes, NC."

Source: Syndicat des Constructeurs Francais de Machines-Outils

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS
By Type of Machine, Units and Value 1984, to Date
(Values in Thousands of U.S. Dollars)

Type of Machine	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
Sheet Metal Bending Machines, non-NC	38	$ 643	147	$ 1,418	176	$2,036
Sheet Metal Folding Machines, non-NC	470	954	874	1,443	1,065	2,625
Sheet Metal Straightening Machines, non-NC	(a)	(a)	(a)	(a)	238	2,060
Bar & Tube Drawing Machines, non-NC	(a)	(a)	(a)	(a)	—	—
Straightening Machines, non-NC	(a)	(a)	(a)	(a)	—	—
Profiling, Flanging & Molding Machines, non-NC	22	1,208	64	1,314	80	2,474
Other Bending Machines, non-NC	(a)	(a)	57	330	146	607
Punching, Shearing & Comb. Punching & Shearing Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Mechanical Shearing Machines, non-NC	(a)	(a)	105	1,037	84	948
Hydraulic Shearing Machines, non-NC	447	6,588	701	10,343	(a)	(a)
Other Shearing Machines, non-NC	622	233	765	638	1,040	8,478
Punching Machines, non-NC	79	744	(a)	(a)	104	1,124
Comb. Punching & Shearing Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Wireworking Machines, non-NC	83	2,295	108	4,932	64	3,013
Presses, NC	—	—	15	2,124	(a)	(a)
Open Front Mechanical Presses, non-NC:						
Less than 10 tonnes	349	1,791	370	2,290	(a)	(a)
10-16 tonnes						
16-25 tonnes						
25-40 tonnes						
40-63 tonnes						
63-80 tonnes						
80-100 tonnes						
100-125 tonnes						
125+ tonnes						
Single or Double Action, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Forging, Stamping & Percussion Presses, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Presses w/Automatic Feed, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Mechanical Press Brakes, non-NC	—	—	—	—	—	—
Hydraulic Press Brakes, non-NC	384	4,851	678	9,307	376	8,944
Drop & Air Hammers, non-NC	—	—	—	—	—	—
Open Front Hydraulic Presses, non-NC	128	2,918	134	2,193	156	3,062
Other Hydraulic Presses, non-NC	(a)	(a)	85	3,170	118	2,377
Other Metal Forming Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Other Metal Forming Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Total Metal Forming, NC	342	17,867	615	23,999	732	37,276
TOTAL METAL FORMING	5,064	76,960	6,399	90,921	6,101	116,816

Exchange Rate: 1984 $1 = 8.7391 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

(a) Data withheld.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associes.

FRENCH PRODUCTION AND EXPORTS OF N/C MACHINES (a)

Units and Value, 1970 to Date

(Values in Millions of U.S. Dollars)

Year	Production		Exports	
	Units	Value	Units	Value
1970	47	$ 11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2
1981	1,238	208.4	NA	NA
1982	1,246	192.4	NA	NA
1983	1,295(b)	255.1(b)	NA	NA
1984	1,625(c)	225.9(c)	NA	NA
1985	D	D	NA	NA
1986	2,608	371.3	NA	NA

NA - Not Available. D - Withheld to avoid disclosure.

(a) The survey covered metalworking and woodworking manufacturers.
(b) Does not include Surface Grinding Machines.
(c) Does not include Spark Erosion Machines.

Source: Syndicat des Constructeurs Francais de Machines-Outils; Survey of 300 enterprises.

FRENCH MACHINE TOOL INDUSTRY

Selected Data, 1982 to Date

(Values in Millions of U.S. Dollars)

	1982	1983	1984	1985	1986
Employment	17,661	15,502	13,443	12,050	11,450
Production Workers	10,265	8,982	7,656	6,670	6,160
Others	7,396	6,520	5,787	5,380	5,290
Average Weekly Hours	38.6	37.8	38.0	38.8	NA
Compensation	$ 237.2	$ 197.0	$156.8	$149.8	$197.8
Wages	112.2	90.1	72.0	65.3	82.8
Salaries	125.0	106.8	84.8	84.5	115.0
Orders(a)	$ 587.7	$ 489.9	$474.0	$490.4	$613.9
Domestic	410.8	320.1	315.7	301.9	410.3
Foreign	176.9	169.8	158.3	188.5	203.6
Shipments(a)	$ 622.1	$ 560.1	$465.5	$499.3	$657.4

NA – Not Available.

Exchange Rates: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7391 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH EXPORTS OF MACHINE TOOLS

By Destination, Units and Value, 1984 to Date

(Values in Thousands of U.S. Dollars)

Destination	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
TOTAL	NA	$250,114	NA	$208,604	NA	$308,071
WESTERN EUROPE						
Austria	432	1,375	NA	1,706	NA	3,166
Belgium-Luxembourg	4,631	6,594	NA	7,153	NA	13,190
Finland	251	837	NA	NA	NA	3,482
Italy	4,116	9,406	NA	8,780	NA	19,004
Netherlands	1,870	3,003	NA	3,267	NA	5,320
Norway	265	778	NA	1,365	NA	3,978
Portugal	928	5,081	NA	1,341	NA	2,039
Spain	2,549	5,048	NA	4,770	NA	6,359
Sweden	1,344	2,492	NA	2,753	NA	3,887
Switzerland	2,849	8,777	NA	9,116	NA	17,993
Turkey	38	671	NA	4,419	NA	3,830
United Kingdom	3,104	10,945	NA	12,655	NA	16,612
West Germany	8,174	21,113	NA	27,280	NA	39,179
EASTERN EUROPE						
Bulgaria	116	1,905	NA	1,305	NA	1,597
Czechoslovakia	23	1,340	NA	1,348	NA	3,679
East Germany	46	1,926	NA	9,618	NA	21,605
Poland	117	3,241	NA	1,284	NA	995
U.S.S.R.	247	11,636	NA	10,793	NA	5,495
Yugoslavia	328	8,331	NA	4,044	NA	642
NORTH AMERICA						
Canada	1,270	7,531	NA	3,116	NA	6,648
Mexico	234	35,546	NA	2,947	NA	864
United States	6,124	23,427	NA	18,813	NA	41,028
SOUTH AMERICA						
Argentina	45	1,160	NA	NA	NA	NA
ASIA						
India	108	3,396	NA	5,986	NA	2,813
Indonesia	113	1,246	NA	2,709	NA	666
Israel	183	3,881	NA	NA	NA	2,059
Japan	641	1,364	NA	NA	NA	1,524
People's Rep. of China	57	2,225	NA	4,314	NA	5,840
Saudi Arabia	2,101	4,379	NA	NA	NA	1,332
Singapore	667	1,234	NA	NA	NA	NA
Taiwan	101	1,743	NA	NA	NA	1,422
OCEANIA						
Australia	734	1,895	NA	2,671	NA	5,734
AFRICA						
Algeria	3,100	12,724	NA	13,200	NA	24,566
Egypt	777	2,045	NA	1,626	NA	4,055
Morocco	1,571	1,282	NA	3,191	NA	3,345
Rep.of S. Africa	725	2,072	NA	NA	NA	860
Tunisia	1,628	3,789	NA	2,108	NA	5,431
Zaire	600	1,776	NA	1,263	NA	1,528
OTHER	NA	30,900	NA	33,663	NA	26,304

NA - Not available; exports, if any, are included in "Other."

Exchange Rate: 1984 $1 = 8.7401, 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

Source: Syndicat de la Machines Outil, de l'Assemblage et de la Productique associee.

FRENCH IMPORTS OF MACHINE TOOLS
By Origin, Units and Value, 1984 to Date
(Values in Thousands of U.S. Dollars)

	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
TOTAL	101,288	$301,173	NA	$357,549	NA	$617,994
WESTERN EUROPE						
Austria	1,390	1,274	NA	3,554	NA	4,901
Belgium-Luxembourg	737	6,899	NA	9,786	NA	21,975
Denmark	1,718	943	NA	762	NA	1,588
Finland	105	427	NA	551	NA	346
Ireland	115	543	NA	173	NA	289
Italy	12,697	54,170	NA	64,820	[illegible]	119,785
Netherlands	1,461	3,003	NA	3,461	NA	4,663
Norway	6	43	NA	91	NA	444
Portugal	34	106	NA	186	NA	127
Spain	1,089	8,287	NA	8,613	NA	17,569
Sweden	1,439	2,813	NA	3,900	NA	6,532
Switzerland	1,958	46,277	NA	51,370	NA	91,163
United Kingdom	951	10,759	NA	14,405	NA	26,418
West Germany	17,380	99,114	NA	111,240	NA	182,716
EASTERN EUROPE						
Bulgaria	88	211	NA	776	NA	408
Czechoslovakia	66	914	NA	555	NA	3,355
East Germany	615	3,089	NA	2,917	NA	7,251
Hungary	7	84	NA	408	NA	922
Poland	40	358	NA	484	NA	2,594
Rumania	1,874	1,125	NA	1,402	NA	1,561
U.S.S.R.	209	1,052	NA	1,682	NA	1,401
Yugoslavia	32	136	NA	73	NA	162
NORTH AND SOUTH AMERICA						
Canada	45	113	NA	1,970	NA	258
United States	1,471	14,251	NA	11,874	NA	30,347
Brazil	2	157	NA	14	NA	82
ASIA						
China	62	578	NA	170	NA	701
India	7	47	NA	6	NA	13
Israel	NA	NA	NA	216	NA	39
Japan	1,015	35,963	NA	53,685	NA	77,474
South Korea	2	43	NA	NA	NA	492
Taiwan	53,867	5,182	NA	4,964	NA	7,414
OTHER	785	3,212	NA	3,441	NA	5,025

NA - Not available; imports, if any, are included in "Other."

Exchange Rate: 1984 $1 = 8.7401 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH FOREIGN TRADE IN MACHINE TOOLS

By Type of Machine, Units and Value, 1984 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	101,288	$301,173	NA	$357,549	NA	$617,994
Metal Cutting Total (including N/C)	91,306	205,620	NA	$261,131	NA	461,143
Boring Machines (including N/C)	456	11,887	NA	19,478	NA	31,095
Boring Machines, N/C	319	6,215	NA	16,455	NA	25,555
Drilling Machines (including N/C)	32,353	19,639	NA	13,548	NA	21,667
Drilling Machines, N/C	167	11,543	NA	6,873	NA	12,411
Gear Cutting	218	4,496	NA	3,485	NA	9,804
Grinding & Polishing	45,781	38,277	NA	46,851	NA	80,256
Lathes (including N/C)	3,538	58,113	NA	72,191	NA	112,513
Lathes, N/C	656	41,908	NA	49,370	NA	78,314
Milling Machines (including N/C)	1,372	27,827	NA	32,630	NA	58,420
Milling Machines, N/C	311	17,396	NA	21,046	NA	37,321
Other Metal Cutting	7,588	45,380	NA	72,949	NA	147,388
Metal Forming Total	9,982	95,553	NA	96,417	NA	156,851
Hydraulic Presses, non-NC	553	4,716	NA	2,837	NA	7,481
Mechanical Presses, non-NC	961	19,574	NA	16,211	NA	26,552
Presses, N/C	49	1,606	NA	3,313	NA	8,479
Forging Machines	152	3,821	NA	4,254	NA	2,925
Punching, Shearing, Bending and Forming Machines	5,004	38,756	NA	37,477	NA	61,799
Wire Drawing Machines	256	6,035	NA	7,177	NA	13,442
Other Metal Forming	3,007	21,043	NA	25,150	NA	36,173
TOTAL EXPORTS	60,674	$250,114	NA	$208,604	NA	$308,071
Metal Cutting Total (including N/C)	47,051	164,534	NA	125,456	NA	190,805
Boring Machines (including N/C)	305	2,738	NA	3,105	NA	9,008
Boring Machines, N/C	755	783	NA	949	NA	4,970
Drilling Machines (including N/C)	8,436	8,620	NA	7,810	NA	22,762
Drilling Machines, N/C	142	1,938	NA	1,080	NA	14,574
Gear Cutting	97	1,090	NA	1,240	NA	1,045
Grinding & Polishing	15,408	52,724	NA	26,767	NA	27,971
Lathes (including N/C)	2,005	33,245	NA	34,983	NA	57,043
Lathes, N/C	271	12,983	NA	11,940	NA	16,261
Milling Machines(including N/C)	2,862	44,849	NA	26,789	NA	39,984
Milling Machines, N/C	273	28,020	NA	11,910	NA	18,080
Other Metal Cutting	17,938	21,268	NA	22,761	NA	32,992
Metal Forming Total	13,623	85,580	NA	83,148	NA	117,266
Hydraulic Presses, non-NC	387	3,633	NA	2,825	NA	7,206
Mechanical Presses, non-NC	1,730	11,376	NA	10,196	NA	12,972
Presses, N/C	15	367	NA	802	NA	2,720
Forging Machines	930	3,033	NA	1,132	NA	814
Punching, Shearing, Bending and Forming Machines	4,812	27,663	NA	32,645	NA	43,265
Wire Drawing Machines	116	6,329	NA	2,954	NA	3,262
Other Metal Forming	5,633	33,179	NA	32,592	NA	47,027

NA - Not Available.

Exchange Rate: 1984 $1 = 8.7401 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination 1983 to Date

(Thousands of U.S. Dollars)

Countries	1983	1984	1985	1986
TOTAL IMPORTS	$181,788	$182,470	$196,449	$346,794
West Germany	65,644	75,583	76,673	127,448
Switzerland	43,390	34,548	39,855	72,713
United States	15,275	13,546	12,412	12,745
Japan	7,374	8,765	11,627	28,240
France	15,012	8,594	8,432	16,099
United Kingdom	6,782	7,570	7699	18,446
Belgium – Luxemborg	2,304	5,122	3,928	13,885
East Germany	3,160	3,984	3,771	7,513
Sweden	4,411	3,870	9,794	9,056
Spain	2,963	3,187	3,352	5,970
Taiwan	3,687	569	1,047	2,683
U.S.S.R.	4,214	2,675	5,604	6,439
Czechoslovakia	1,975	1,992	2,200	5,098
Netherlands	922	2,106	4,190	2,683
Austria	1,514	2,390	890	6,507
Other Imports	3,161	7,173	4,975	11,269
TOTAL EXPORTS	$603,437	$557,997	$707,395	$969,681
West Germany	58,006	59,818	103,121	139,791
United States	39,110	57,826	94,113	129,528
France	92,771	54,013	64,628	118,728
U.S.S.R.	64,590	45,248	42,422	73,115
Turkey	24,361	28,002	35,351	14,288
United Kingdom	18,765	26,010	31,266	42,729
Switzerland	14,156	22,425	21,787	41,588
Netherlands	5,662	6,830	10,422	15,093
Yugoslavia	10,403	7,285	6,128	13,617
Bulgaria	1,844	5,009	8,537	10,196
Algeria	6,518	10,529	15,450	16,837
China	5,992	10,017	26,396	47,693
Sweden	9,284	9,789	12,517	19,050
Belgium – Luxemborg	11,061	9,676	13,355	21,800
Austria	8,362	8,879	9,532	18,514
Spain	10,732	8,253	10,527	20,123
Greece	8,889	7,797	7,437	10,464
Poland	3,950	7,968	10,422	10,464
Egypt	6,979	10,928	7,646	9,458
Canada	4,872	7,740	24,301	28,642
Other Exports	197,130	153,955	152,037	167,963

Exchange Rate: 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0 Lire; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire.

Source: Unione Costruttori Italiani Macchine Utensili.

ITALIAN EXPORTS OF MACHINE TOOLS

1983 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1983	1984	1985	1986
TOTAL	$603,437	$557,997	$707,395	$969,679
Lathes	81,634	54,963	75,305	77,106
Boring Machines	48,082	35,825	34,046	43,962
Milling Machines	54,592	47,575	92,515	148,005
Drilling Machines	45,335	23,563	27,954	32,352
Broaching Machines	7,328	1,028	6,424	3,424
Grinding Machines	52,388	47,271	58,431	86,442
Other Abrasive Machines	30,227	NA	NA	NA
Gear Cutting Machines	3,737	2,337	2,213	6,515
Shaping-Sawing-Cutting off-Slotting Machines	22,349	22,923	26,119	37,206
Presses	44,250	51,234	62,035	100,963
Shears and Punching Machines	23,688	21,306	25,652	44,702
Bending Machines	31,474	27,170	29,207	38,980
Forging Machines	5,213	4,892	10,281	12,999
All Others	153,140	217,910	257,213	337,024

NA – Not Available.

Exchange rates: 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0 Lire; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiani Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS

1983 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1983	1984	1985	1986
TOTAL	$181,788	$182,470	$196,449	$346,810
Lathes	25,959	30,887	34,695	73,481
Boring Machines	16,522	7,294	7,950	9,431
Milling Machines	10,927	13,966	19,182	38,192
Drilling Machines	6,023	6,775	5,304	16,151
Grinding Machines	25,645	22,516	24,780	29,249
Other Abrasive Machines	10,546	NA	NA	NA
Gear Cutting Machines	4,026	4,925	3,706	7,706
Shaping-Sawing-Cutting off-Slotting Machines	5,698	6,506	7,846	12,946
Presses	13,434	12,178	11,099	23,308
Shears and Punching Machines	5,637	7,690	9,476	13,253
Bending Machines	5,094	4,929	6,313	8,648
Forging Machines	4,431	622	906	1,410
All Others	47,846	64,182	65,192	113,486

NA – Not Available.

Exchange rates: 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0.; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiani Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS
By Weight and Value, 1972 to Date
(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

	Shipments		Imports		Exports	
Year	Weight	Value	Weight	Value	Weight	Value
1972	170.0	$ 523.0	47.8	$134.8	62.5	$206.6
1973	162.0	620.9	55.6	187.0	57.2	236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	359.0
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981	NA	1,539.4	44.0	300.3	86.3	795.2
1982	NA	1,138.6	25.6	208.6	70.9	639.9
1983	NA	1,037.0	NA	181.8	NA	603.4
1984	NA	996.0	NA	182.5	NA	558.0
1985	NA	1,115.5	NA	196.4	NA	707.4
1986	NA	1,624.6	NA	346.8	NA	969.7

NA – Not Available.

Exchange Rate: 1972 $1 = 583.2 Lire; 1973 $1 = 583.0 Lire; 1974 $1 = 650.3 Lire; 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.55 Lire; 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire.

Source: Unione Costruttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS
Cutting & Forming, By Type of Machine, 1985 and 1986
(Thousands of U.S. Dollars)

	Production		Imports		Exports	
Machine Classification	1985(r)	1986E	1985	1986	1985	1986
GRAND TOTAL	$225,748	$316,026	$201,596	$288,749	$184,834	$238,306
Total Metal Cutting	101,126	146,569	118,221	173,440	78,911	99,627
Drilling Machines	10,202	14,787	7,063	5,999	8,741	12,748
Gear Cutting Machines	—	—	2,662	819	174	217
Grinding and Polishing	46,267	67,057	17,269	25,541	40,058	43,153
Lathes	25,415	36,835	46,928	46,928	17,714	28,811
Milling Machines	18,344	26,587	20,568	36,087	9,216	11,932
Broaching Machines	—	—	91	984	47	46
Planers and Shapers	—	—	1,329	493	234	75
Other Metal Cutting Machines	899	1,302	32,879	56,589	2,480	2,645
Total Metal Forming	60,256	80,055	38,778	55,820	60,525	64,977
Hammers	857	1,138	389	605	376	534
Presses inc. Forging Presses	20,250	26,904	9,825	8,757	24,610	24,327
Punching and Shearing Machines	8,177	10,864	11,894	23,383	12,755	16,331
Other Metal Forming Machines	30,972	41,148	23,075	23,075	22,784	23,785
Parts and Accessories	64,366	89,402	44,597	59,490	45,398	73,702

E – Estimate. r – Revised.

Exchange Rate; 1985 $1 = 8.6039 Kronor; 1986 $1 = 7.1236 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Country, 1984 to Date

(Thousands of U.S. Dollars)

	Imports			Exports		
Country	1984	1985	1986	1984	1985	1986
TOTAL	$127,849	$157,000	$229,259	$124,891	$139,436	$164,603
Europe	97,042	116,207	175,909	83,771	88,599	117,929
Austria	1,869	1,418	6,701	1,311	1,222	3,434
Belgium	1,271	1,332	3,871	1,005	458	2,279
Denmark	3,782	4,852	6,909	7,687	10,291	13,101
Finland	1,730	2,483	4,095	7,224	6,973	7,401
France	1,965	2,810	2,920	1,880	3,706	5,655
Italy	13,059	12,307	16,518	6,458	9,467	10,613
Netherlands	1,624	1,711	4,465	2,960	2,856	4,545
Norway	583	508	758	6,825	6,384	9,446
Portugal	—	23	122	39	97	481
Spain	3,478	4,663	5,991	1,521	1,759	526
Switzerland	9,654	11,840	22,453	1,696	2,344	3,619
United Kingdom	6,083	11,023	9,279	9,012	12,270	21,162
West Germany	47,442	56,103	82,508	18,128	17,192	26,685
East European Bloc	4,403	5,039	9,011	16,129	10,752	5,515
Czechslovakia	2,338	3,034	4,503	86	626	181
U.S.S.R.	472	643	757	11,650	5,670	777
Other East Bloc (a)	1,593	1,362	3,751	4,393	4,455	4,557
All Other Europe	98	95	308	1,897	2,827	3,473
United States	4,879	4,462	4,341	20,767	31,521	22,257
Canada	189	65	168	3,741	3,068	3,070
South & Central America	13	—	52	1,103	1,475	1,205
Japan	23,276	34,269	45,939	1,321	1,901	1,036
China	190	78	179	1,367	1,610	7,577
Taiwan	2,059	1,705	2,207	164	201	129
All Other Asia	34	177	417	7,934	6,572	7,882
Africa	—	—	—	2,168	2,933	2,241
All Other	—	36	48	974	1,558	1,276

Exchange Rate: 1984 $1 = 8.2718; 1985 $1 = 8.6039 Kronor; 1986 $1 = 7.1236 Kroner.

(a) Includes Bulgaria, GDR, Hungary, Poland and Romania.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

NUMBER OF COMPANIES AND EMPLOYEES IN THE SWEDISH MACHINE TOOL INDUSTRY

	1981	1982	1983	1984	1985	1986
Number of Companies	38	36	36	35	36	33
Number of Employees	3,700	3,200	3,000	3,000	3,070	3,100

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS
1984 to Date
(Thousands of U.S. Dollars)

	Exports			Imports		
	1984	1985(r)	1986	1984	1985(r)	1986
GRAND TOTAL	$671,953	$836,292	$1,259,912	$130,409	$170,032	$313,164
Argentina	796	1,598	3,085	—	—	—
Australia	4,575	7,049	7,396	—	—	4
Austria	10,801	14,995	21,218	1,826	3,919	5,647
Belgium – Luxembourg	7,519	7,611	13,792	571	1,201	3,190
Brazil	2,028	3,413	9,941	—	—	41
Bulgaria	19,085	19,408	42,373	128	20	67
Canada	5,424	8,971	14,120	47	27	27
People's Rep. of China	14,568	26,272	51,768	—	—	1
Czechoslovakia	12,036	17,714	24,509	502	998	1,972
Denmark	5,758	7,200	10,663	1,000	936	1,563
East Germany	4,159	3,314	12,537	407	208	380
Finland	2,938	2,903	8,231	131	96	148
France	46,280	49,790	94,467	9,011	8,714	17,614
Hungary	2,222	2,433	2,970	355	206	496
India	13,970	13,583	19,485	185	127	124
Indonesia	3,748	421	2,710	—	—	—
Iran	7,080	3,474	9,158	—	—	2
Israel	4,961	4,042	6,015	56	68	233
Italy	37,681	45,694	72,970	16,193	20,430	35,011
Japan	52,902	62,665	53,977	16,477	27,460	48,684
Mexico	3,666	6,675	5,383	—	61	—
Netherlands	12,676	13,182	19,800	2,031	1,117	3,860
Pakistan	2,016	2,113	1,622	—	—	—
Poland	7,003	10,008	12,554	1,329	15	12
South Africa	3,405	3,341	3,714	—	44	168
Spain	6,791	6,255	11,828	1,703	1,956	2,928
Sweden	9,549	13,875	26,376	1,141	2,074	3,740
Taiwan	7,918	4,561	5,574	920	518	3,936
United Kingdom	25,968	38,996	48,821	3,175	5,393	7,019
United States	93,240	123,453	134,419	1,912	5,253	5,325
U.S.S.R.	34,580	61,302	84,910	387	557	1,522
West Germany	145,132	187,720	342,791	70,077	87,990	168,078
Yugoslavia	13,305	3,968	15,777	7	5	20
All Other	48,174	58,293	64,958	785	639	1,352

r - Revised.

Exchange Rate: 1984 $1 = 2.3497 Swiss Francs; 1985 $1 = 2.4571 Swiss Francs; 1986 $1 = 1.7989 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen – Industrieller.

NETHERLANDS SALES OF MACHINE TOOLS AND PARTS
By Machine Types, 1981 to Date
(Thousands of U.S. Dollars)

Type of Machine	1981	1982	1983	1984	1985	1986
GRAND TOTAL	$60,035	$50,558	$29,326	$34,406	$58,921	$83,633
Metal Cutting Machine Tools	25,970	22,545	12,894	17,827	28,753	45,102
Metal Forming Machine Tools	27,012	17,040	12,158	12,248	22,039	28,653
Hydraulic Presses	5,771	3,595	1,261	1,870	933	1,510
Mechanical Presses	5,931	4,382			1,054	1,020
Bending, Forming, Straightening, Cutting & Edging	1,964	4,382	6,061	4,488	4,275	5,347
Other Metal Forming	13,346	9,288	4,835	5,890	7,647	10,898
Metal Cutting Parts & Accessories	3,326	3,221	4,275	4,332	8,129	9,878
Metal Forming Parts & Accessories	3,687	3,108				

Exchange Rate: 1981 $1 = 2.4952 Guilders; 1982 = 2.6702 Guilders; 1983 $1 = 2.8541; Guilders; 1984 $1 = 3.2087 Guilders; 1985 $1 = 3.214 Guilders; 1986 $1 = 2.45 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal – Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS
By Type of Machine, 1984 to Date
(Thousands of U.S. Dollars)

	Imports			Exports		
Type of Machine	1984	1985	1986	1984	1985	1986
TOTAL	$153,302	$191,937	$326,735	$81,653	$97,971	$162,204
Lathes	18,855	23,574	38,204	3,896	5,148	7,306
Milling Machines	27,363	34,022	60,898	11,500	14,392	27,224
Grinding, Honing and Polishing Machines	11,126	12,766	22,163	10,253	13,549	28,694
Hydraulic Presses	2,400	5,931	11,102	3,896	5,179	7,837
Other Presses	3,927	4,245	6,000	1,496	4,396	3,061
Bending, Forming, Straightening, Cutting and Edging Machines	22,688	24,779	42,327	18,045	18,516	30,531
Other Metalworking Machine Tools	26,179	30,319	44,490	7,698	7,617	9,306
Parts and Accessories	40,764	56,302	101,551	24,870	29,174	48,245

Exchange Rates: 1984 $1 = 3.2087 Guilders; 1985 $1 = 3.3214 Guilders; 1986 $1 = 2.45 Guilders.

Note: Individual items may not add to toals due to rounding.

Source: Vereniging Van Metaal – Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1984 to Date

(Values in Thousands of U.S. Dollars)

Machine Classifications	1984		1985		1986	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$358,565	NA	$458,218	NA	$603,619
Boring Machinery & Parts	172	12,696	289	14,511	323	14,564
Drilling Machinery & Parts	15,328	14,622	15,243	13,218	17,884	13,459
Grinding Machinery & Parts	90,032	33,021	88,758	38,072	90,813	41,001
Automatic Lathes	893	27,714	1,082	40,861	977	39,121
Turret Lathes, N.E.C.	423	1,064	599	1,739	497	1,602
Lathes & Parts, N.E.C.	1,159	14,489	1,850	19,060	1,724	19,874
Milling Machines & Parts	1,425	20,272	1,965	24,739	2,122	32,576
Shapers, Gear Makers & Parts	519	12,164	739	17,974	548	13,540
Transfer Machines & Parts	12	37,244	20	50,740	41	62,207
Sawing Machines & Parts	NA	13,377	NA	15,750	NA	15,832
Metalworking Presses & Parts	1,913	35,339	1,819	49,069	1,452	153,152
Rolls, Bending Machines & Parts	NA	12,019	NA	13,159	NA	17,244
Shearing Machines & Parts	510	3,471	454	4,071	467	4,244
Metal Forging Stamping Machines & Parts	167	8,060	119	6,523	113	11,610
Can Making Machinery & Parts	NA	34,401	NA	39,870	NA	49,571
Machine Tools & Parts, N.E.C.	NA	78,592	NA	108,862	NA	114,022
TOTAL EXPORTS(a)	NA	$119,358	NA	$104,954	NA	$144,252
Boring, Drilling Machinery & Parts	848	6,187	686	7,104	202	6,138
Grinding Machinery & Parts	352	2,502	188	2,527	160	5,069
Lathes & Parts	330	5,291	251	4,382	229	3,516
Metalworking Presses & Parts	180	7,202	198	5,463	138	7,131
Machine Tools & Parts, N.E.C.	NA	98,176	NA	85,378	NA	122,398

NA – Not Available. N.E.C. – Not Elsewhere Classified.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1984 $1 = 1.2951 Canadian dollars; 1985 $1 = 1.3655 Canadian dollars; 1986 $1 = 1.3895 Canadian dollars.

Source: Statistics Canada.

THE INDIAN MACHINE TOOL INDUSTRY
Production and Exports
(Values in Thousands of U.S. Dollars)

	Production						Exports	
	1984		1985		1986		1986	
Type of Machine	Units	Value	Units	Value	Units	Value	Units	Value
Total Machine Tools	9,465	$164,333	9,284	$158,119	9,272	$153,750	1,649	$33,357
Boring machines	98	11,272	86	9,904	69	7,988	11	1,718
Drilling machines	1,200	9,231	1,563	8,599	1,249	11,400	41	255
Milling machines	1,161	17,681	1,173	18,445	1,254	16,825	207	4,037
Gear cutting machines	28	2,573	45	2,018	36	2,945	(a)	(a)
Broaching machines	16	853	21	1,275	16	825	(a)	(a)
Lapping, honing, polishing machines	47	62	48	95	98	833	4	37
Machining centers	(a)	(a)	(a)	(a)	41	6,525	20	3,404
Automatic screw machines	555	15,798	663	15,674	554	15,751	215	7,370
Lathes	3,883	42,108	3,401	41,018	3,093	35,852	486	4,237
Grinding machines	783	13,462	888	13,404	1,198	16,543	559	10,776
Sawing machines	228	605	253	1,013	196	864	4	5
Shaping machines	160	3,287	145	2,093	127	2,036	(a)	(a)
Slotting machines	53	1,897	35	513	70	1,496	(a)	(a)
Screwing & threading	49	961	50	795	58	961	40	448
Presses	445	16,750	373	15,652	463	12,326	6	803
Shearing & sheet metal	187	5,660	172	5,190	160	4,934	1	9
Other	572	22,133	368	22,432	590	15,646	55	258

(a) Included in "Other."

Exchange Rate: 1984 $1 = 11.363; 1985 $1 = 12.369; 1986 $1 = 12.611.

Source: Indian Machine Tool Manufacturers' Association (IMTMA).

TAIWAN'S PRODUCTION, IMPORTS, EXPORTS AND CONSUMPTION OF MACHINE TOOLS
By Type of Machine, 1986
(Thousands of U.S. Dollars)

Machine Classification	Production	Imports	Exports	Consumption
GRAND TOTAL	$371,778	$85,938	$264,901	$192,815
Boring Machines	2,416	2,123	1,617	2,922
Drilling Machines	70,154	5,849	56,575	19,428
Milling Machines	49,824	4,004	36,115	17,713
Lathes	77,643	8,124	62,619	23,148
Gear-making Machines	314	1,161	157	1,318
Grinding Machines	62,322	14,416	45,997	30,741
Machining Centers	42,168	4,041	35,140	11,069
Sawing Machines	19,372	653	14,767	5,256
Presses	28,762	27,545	7,191	49,116
Planing Machines	944	247	890	301
Other Machinery	17,860	17,774	3,833	31,801

Exchange Rate: $1 = 35.5 NT.

Consumption = Production + Imports − Exports.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN IMPORTS OF MACHINE TOOLS, 1983
By Type of Machine; Major Countries of Origin
(Values in Thousands of Dollars)

Type of Machine	Japan	France	West Germany	Switzerland	United States	World Total
GRAND TOTAL						
Units	4,504	25	115	73	138	5,246
Value	$71,248	$5,061	$12,923	$5,269	$5,794	$112,987
Boring Machines						
Units	57	—	4	8	—	79
Value	$ 2,868	—	$ 1,995	$ 400	—	$ 5,806
Drilling Machines						
Units	286	10	3	1	21	347
Value	$ 735	$ 7	$ 322	$1,392	$2,606	$ 5,428
Milling Machines						
Units	127	5	10	—	13	205
Value	$ 5,870	$ 395	$ 3,496	—	$ 245	$ 10,891
Lathes						
Units	357	—	26	12	11	461
Value	$ 6,451	—	$ 1,866	$ 503	$ 55	$ 9,753
Gear Grinding						
Units	39	—	9	—	—	56
Value	$ 2,023	—	$ 831	—	—	$ 3,205
Grinding Machines						
Units	146	—	19	18	13	249
Value	$ 4,306	—	$ 1,587	$ 484	$ 292	$ 7,980
Universal Machining Centers						
Units	36	—	—	1	2	39
Value	$ 3,590	—	—	$ 246	$ 652	$ 4,488
Sawing Machines						
Units	94	1	3	—	8	153
Value	$ 1,037	$ 5	$ 33	—	$ 902	$ 2,072
Presses						
Units	514	—	7	9	15	565
Value	$22,305	—	$ 289	$ 674	$ 434	$ 24,072
Planing Machines						
Units	7	—	1	—	—	14
Value	$ 432	—	$ 7	—	—	$ 467
All Other						
Units	2,841	9	33	24	55	3,078
Value	$21,634	$4,654	$ 2,497	$1,571	$ 609	$ 38,825

Exchange Rate: $1 = 39.0 NT.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN EXPORTS OF MACHINE TOOLS, 1983

By Region

(Values in Thousands of Dollars)

Type of Machine	World Total	Asia	Europe	Africa	North America	All Other
GRAND TOTAL						
Units	718,798	23,606	127,312	16,281	504,686	46,913
Value	$135,361	$23,131	$17,862	$3,825	$80,145	$10,398
Boring Machines						
Units	8	5	—	—	3	—
Value	$ 198	$ 8	—	—	$ 190	—
Drilling Machines						
Units	626,960	18,069	119,628	13,462	436,081	41,720
Value	$ 50,737	$ 2,295	$10,764	$1,463	$32,245	$ 3,972
Milling Machines						
Units	6,236	712	203	35	4,985	301
Value	$ 18,395	$ 2,328	$ 588	$ 155	$14,528	$ 796
Lathes						
Units	12,561	2,120	1,360	378	6,750	1,953
Value	$ 33,518	$ 8,276	$ 3,095	$ 826	$17,474	$ 3,846
Gear Making						
Units	15	14	—	—	—	1
Value	$ 76	$ 73	—	—	—	$ 3
Grinding Machines						
Units	2,105	341	78	42	1,576	68
Value	$ 7,326	$ 1,288	$ 328	$ 245	$ 5,134	$ 331
Machining Centers						
Units	94	4	38	—	49	3
Value	$ 3,927	$ 141	$ 1,464	—	$ 2,272	$ 50
Sewing Machines						
Units	65,425	957	5,823	2,171	53,873	2,601
Value	$ 9,386	$ 452	$ 949	$ 402	$ 6,954	$ 629
Presses						
Units	217	168	—	11	33	5
Value	$. 2,577	$ 2,182	—	$ 245	$ 104	$ 45
Planing Machines						
Units	139	109	2	8	—	20
Value	$ 486	$ 378	$ 4	$ 24	—	$ 79
All Other						
Units	3,038	1,107	180	174	1,336	241
Value	$ 8,735	$ 5,707	$ 671	$ 465	$ 1,245	$ 647

Exchange Rate: $1 = 39.0 NT.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN EXPORTS OF MACHINE TOOLS, 1983

By Country

(Values in Thousands of Dollars)

Type of Machine	United States	Australia	Canada	West Germany	United Kingdom	Japan
GRAND TOTAL						
Units	463,864	35,411	40,745	33,442	15,224	2,665
Value	$73,666	$6,801	$6,113	$4,365	$3,778	$3,413
Boring Machines						
Units	2	—	1	—	—	—
Value	$ 84	—	$ 106	—	—	—
Drilling Machines						
Units	399,957	31,373	36,115	31,665	11,433	1,951
Value	$29,482	$2,795	$2,752	$2,871	$1,232	$ 641
Milling Machines						
Units	4,767	174	213	26	104	81
Value	$13,753	$ 484	$ 758	$ 77	$ 229	$ 349
Lathes						
Units	5,978	1,578	734	409	192	418
Value	$15,805	$2,643	$1,541	$ 719	$1,058	$2,063
Gear Making						
Units	—	1	—	—	—	—
Value	—	$ 3	—	—	—	—
Grinding Machines						
Units	1,492	47	68	12	6	42
Value	$ 4,754	$ 241	$ 294	$ 116	$ 13	$ 185
Machining Centers						
Units	48	2	1	1	17	—
Value	$ 2,210	$ 39	$ 62	$ 132	$ 732	—
Sawing Machines						
Units	50,374	2,049	3,495	1,328	3,433	116
Value	$ 6,428	$ 456	$ 520	$ 205	$ 459	$ 28
Presses						
Units	30	1	3	—	—	—
Value	$ 102	$ 15	$ 3	—	—	—
Planing Machines						
Units	—	4	—	—	—	3
Value	—	$ 12	—	—	—	$ 22
All Other						
Units	1,216	182	115	1	39	54
Value	$ 1,048	$ 115	$ 78	$ 246	$ 56	$ 124

Exchange Rate: $1 = 39.0 NT.

Source: World Trade Promotion Corp., Taiwan.

KOREAN PRODUCTION OF MACHINE TOOLS

By Type, 1976 to 1985

(Millions of Dollars)

Machine Classifications	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985(p)
GRAND TOTAL	$22.9	$52.8	$113.9	$113.9	$92.3	$99.0	$124.8	$167.9	$219.9	$180.4
Metal Cutting Total	13.9	31.5	75.0	58.8	59.5	65.0	78.0	103.6	128.3	146.2
Lathes	9.7	23.4	57.8	36.9	41.0	35.0	32.0	37.6	46.5	40.2
NC Lathes	—	—	—	—	—	4.0	10.4	11.3	12.8	16.2
Milling	1.4	2.1	6.5	11.1	6.8	12.1	14.4	18.2	23.2	20.6
NC Milling	—	—	—	—	—	=	—	0.9	2.1	3.1
Drilling	0.5	3.4	4.8	4.9	2.7	3.8	2.8	5.1	6.3	6.7
Boring	—	0.1	1.2	1.6	1.3	2.4	3.1	1.9	2.6	3.1
Grinding	0.5	0.3	1.6	1.2	2.3	4.3	4.4	4.7	8.6	8.5
Electrical Discharge	—	—	—	—	—	—	1.3	1.0	4.8	4.1
Sawing	0.3	0.2	0.8	0.6	2.9	0.7	0.7	1.1	1.7	2.2
Gear Cutting	0.1	0.2	0.5	1.0	0.7	0.3	0.3	1.6	0.1	1.2
Tapping	—	—	—	—	0.2	0.2	0.1	0.5	1.0	0.7
Shaping	0.3	0.8	1.0	0.2	0.4	0.2	—	0.3	1.0	0.2
Planing	1.0	0.5	0.4	1.1	1.3	0.8	0.6	0.4	0.6	0.7
Special Purpose	—	—	—	—	—	—	1.7	4.5	3.3	7.6
Machining Centers	—	—	—	—	—	0.7	5.3	10.1	12.4	19.5
Other Metal Cutting	—	0.5	0.3	0.1	0.1	0.5	0.7	4.4	1.4	11.4
Metal Forming Total	8.9	21.3	39.0	55.1	32.7	34.0	46.8	64.3	91.6	34.2
Presses	5.4	12.5	24.2	46.7	17.5	19.0	31.7	39.1	58.0	24.7
Rolling Machines	0.8	2.7	5.4	3.7	5.6	1.2	4.2	8.3	3.5	4.1
Shearing	—	—	—	—	—	—	0.3	1.1	1.4	1.4
Wire Drawing	—	—	—	—	—	—	1.6	2.2	5.2	2.9
Bending	—	—	—	—	—	—	—	0.3	0.9	0.2
Other Metal Forming	2.7	6.1	9.4	4.8	9.7	13.8	9.1	13.2	22.5	0.8

p - Preliminary.

Individual items may not add to totals due to rounding.

Exchange rate: 1976-1979 $1 = 484.00 Won; 1980 $1 = 607.43 Won; 1981 $1 = 681.03 Won; 1982 $1 = 731.08 Won; 1983 $1 = 775.75 Won; 1984 $1 = 805.98 Won; 1985 $1 = 870.02 Won.

Source: Korea, Economic Planning Board and Korea Machine Tool Manufacturers' Association.

KOREAN EXPORTS OF MACHINE TOOLS
BY COUNTRY AND REGION, 1976 to 1985
(Thousands of Dollars)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
TOTAL EXPORTS	$396	$1,641	$4,137	$14,331	$22,989	$30,621	$34,920	$21,430	$21,569	$23,434
North America										
U.S.A	11	183	1,851	6,086	8,543	14,701	17,944	8,514	8,105	8,873
Asia										
Japan	94	276	746	3,219	8,936	5,552	7,441	5,543	6,477	3,591
Indonesia	4	41	27	57	473	982	2,124	623	1,171	1,198
Malaysia	—	9	16	80	222	246	1,303	966	423	226
Singapore	36	86	—	38	317	203	131	239	98	45
Western Europe										
West Germany	—	—	—	61	660	983	286	43	602	2,668
United Kingdom	—	—	—	1,805	206	342	72	522	1,180	1,227
France	—	—	17	1	9	36	23	678	38	—
Netherlands	—	—	—	—	49	545	746	1,799	1,090	944
Oceania										
Australia	18	3	52	23	208	1,290	524	317	369	407
Middle East										
Saudi Arabia	130	224	356	602	669	1,067	1,144	416	128	146
Africa	3	92	458	1,320	688	1,412	676	407	683	911
All Other Countries	100	725	614	837	2,009	3,263	2,506	1,363	1,185	3,198

Source: Korea, The Office of Customs Administration.

KOREAN IMPORTS OF MACHINE TOOLS
BY COUNTRY AND REGION, 1976 to 1985
(Thousands of Dollars)

Origin	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
TOTAL IMPORTS	$101,618	$152,678	$250,247	$310,841	$173,755	$130,270	$86,706	$139,750	$135,030	$228,645
North America										
U.S.A.	11,341	9,458	14,973	29,683	19,546	30,576	13,435	10,507	9,901	12,605
Asia										
Japan	48,033	118,162	200,040	181,952	119,557	45,558	36,060	112,785	86,611	173,186
Taiwan	202	203	1,542	728	490	169	92	334	272	715
Singapore	—	—	—	—	7	54	69	37	803	151
Western Europe										
West Germany	5,857	13,966	18,302	53,236	18,180	31,395	27,384	7,083	24,505	26,197
United Kingdom	25,135	1,354	3,092	19,181	3,903	2,180	3,369	599	2,292	3,791
Italy	340	85	588	4,026	2,412	3,740	1,675	1,781	2,195	883
Switzerland	1,256	1,777	3,356	7,538	3,045	2,459	2,026	3,128	4,423	8,439
France	7,340	300	4,951	9,302	2,249	6,655	674	1,067	66	178
Sweden	195	184	1,406	1,386	497	956	129	1,295	2,756	1,051
All Other Countries	1,919	7,189	1,997	3,809	3,869	6,528	1,795	1,114	1,206	1,449

Source: Korea, The Office of Customs Administration.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1983 to 1985

	Unit of Measure	1983	1984(r)	1985
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	190	188	182
Metal Cutting Machines(a)	Mill. Rubles	2,200	2,390	2,674
Metal Cutting Machines, NC	Units	11,400	13,300	17,600
Presses—Forging Machines	Thousands	57	55	53
Presses—Forging Machines(a)	Mill. Rubles	657	664	662
OTHER SELECTED PRODUCTS AND INDUSTRIES				
Electric Power	Bill. Kwh	1,418	1,492	1,545
Petroleum	Mill. Tons	616	613	595
Gas	Bill. Cu. Meters	536	587	643
Coal Incl. Coking Coal	Mill. Tons	716	712	726
Cast Iron	Mill. Tons	110	111	110
Steel	Mill. Tons	153	154	155
Rolled Ferrous Metal	Mill. Tons	122	123	128
Steel Pipe	Mill. Meters	2,711	2,738	2,747
Steel Pipe	Mill. Tons	19	19	19
Iron Ore	Mill. Tons	245	247	248
Instruments & Automation Equip. with Spare Parts(a)	Mill. Rubles	4,300	4,600	4,800
Computing Equip. with Spare Parts(a)	Mill. Rubles	3,300	3,700	4,200
Automobiles	Thousands	1,315	1,327	1,332

r - Revised.

(a) Data in wholesale prices.

Source: The U.S.S.R. in Figures for 1984 - U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

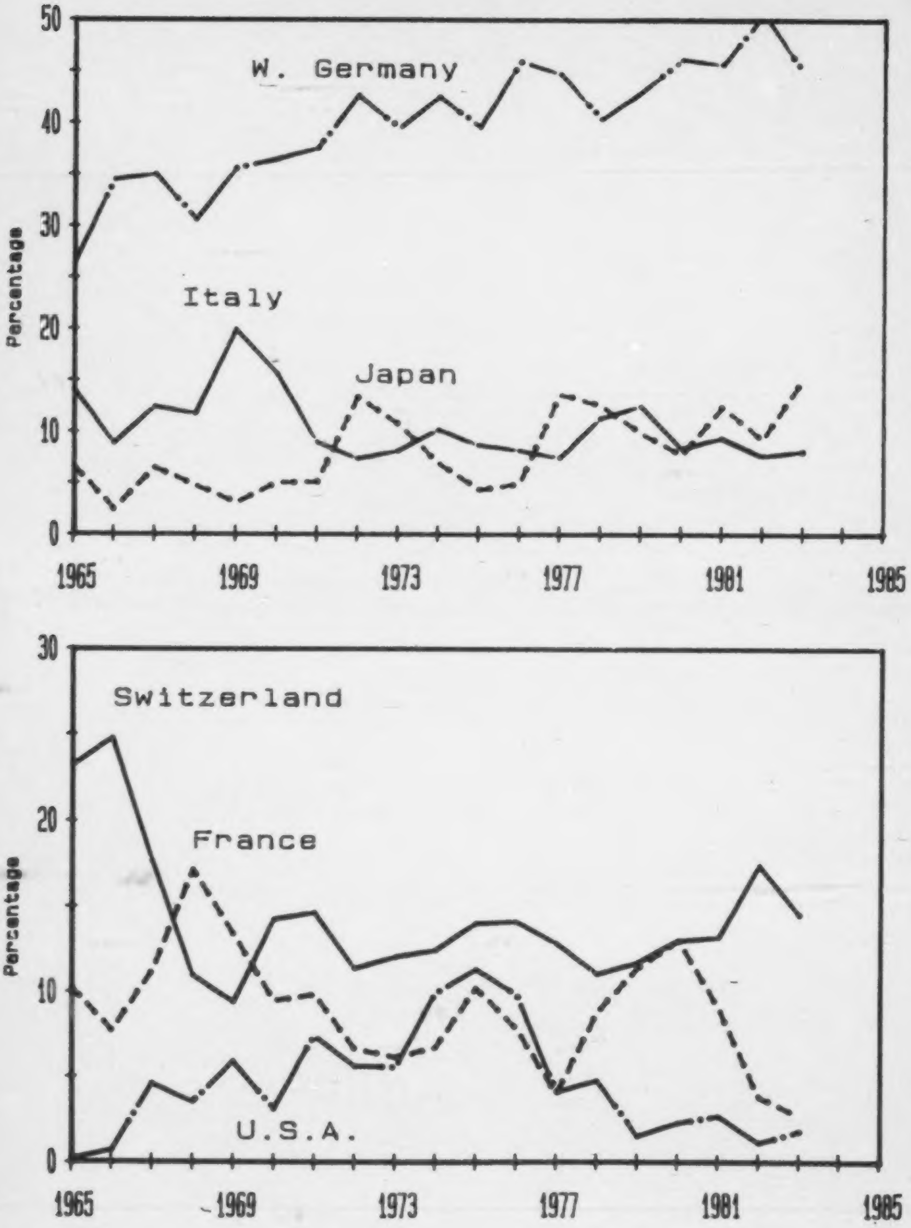
The official exchange rate: 1983 $1 = .743 rubles; 1984 $1 = .816 rubles; 1985 $1 = .838 rubles.

U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1940 to 1985

Year	Metal Cutting MachineTools	Forging Machines & Presses	Year	Metal Cutting MachineTools	Forging Machines & Presses
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,671	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980	216,000	57,200
1966	192,200	38,412	1981	205,000	57,100
1967	197,000	41,126	1982	195,000	57,300
1968	200,600	42,128	1983	190,000	57,400
1969	205,300	42,658	1984	188,000	55,300
1970	202,300	41,268	1985	182,000	52,700

Source: The U.S.S.R. in Figures for 1985—U.S.S.R. Central Statistical Administration.

EAST BLOC MACHINE TOOL IMPORTS
From Six Non-Communist Nations



EASTERN BLOC (a) MACHINE TOOL IMPORTS
FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)
Total and Selected Nations, 1965 to 1983
(Values in Millions of U.S. Dollars)

		United States		France		West Germany		Italy		Japan		Switzerland	
Year	Total	Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)
1965	$ 60.9	$ .1	.2%	$ 6.2	10.2%	$ 16.0	26.3%	$ 8.5	14.0%	$ 4.0	6.6%	$ 14.1	23.2%
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.6	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	899.6	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	14.0
1976	976.8	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	1,127.8	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	1,331.3	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	1,243.8	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7
1980	998.4	23.4(e)	2.3	130.0	13.0	461.5	46.2	83.3	8.3	77.0	7.7	129.9	13.0
1981	719.9	19.6(e)	2.7	64.7	9.0	328.2	45.6	68.0	9.4	89.5	12.4	94.9	13.2
1982	667.9	7.1	1.1	25.2(i)	3.8	338.0	50.6	50.7	7.6	61.2(h)	9.2	116.0	17.4
1983	787.1	14.0(g)	1.8	21.0	2.7	352.7	44.8	63.7	8.1	118.7(i)	15.1	114.0	14.5

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland, Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.
(g) Does not include Hungarian imports.
(h) Does not include Polish imports.
(i) Does not include Romanian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports," Commodity Series, Machine Tools For Working Metals; and NMTBA.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)

U.S. and Selected Communist Countries

For selected years, 1960 to 1985

	1960	1970	1975	1979	1980	1981	1982(r)	1983(r)	1984(r)	1985
United States (b)										
Million US $	$539.30	$1,097.70	$1,790.40	$2,900.00	NA	NA	NA	NA	NA	NA
Thousand units	42.91	49.31	64.32	76.07	61.37	72.01	49.10	35.40	34.45	33.82
Communist Countries										
USSR and Eastern Europe										
USSR										
Million US $	$611.74	$1,427.88	$2,179.78	$2,959.87	NA	NA	NA	NA	NA	NA
Thousand units	155.92	202.16	231.35	230.00	216.00	205.00	195.00	190.00	188.00	182.00
Bulgaria (thousand units)	3.15	13.94	16.28	16.47	18.87	18.67	17.90	15.12	15.20	15.40
Czechoslovakia(thousand units)	30.23	35.19	29.66	35.66	36.90	34.70	37.10	35.40	36.90	38.40
East Germany (thousand units)	41.90	22.22	19.72	18.42	17.50	16.80	18.00	20.40	20.70	20.91
Hungary (thousand units)	9.78	14.46	12.63	12.06	10.20	10.90	13.10	13.10	11.30	11.41
Poland (thousand units)	22.47	29.73	33.19	30.86	26.20	30.50	32.20	37.90	45.60	52.50
Romania (thousand units)	4.44	14.14	26.27	27.19	29.40	36.70	37.90	59.00	80.20	85.81
China (thousand units)	NA	140.00	175.00	140.00	134.00	103.00	100.00	118.00	131.40	154.50

NA - Not Available. r – Revised.

(a) Power – driven metalcutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include lathes and planers and milling, honing, lapping, grinding, electroerosion, and ultrasonic cutting machines.

(b) Average value of $1,000 and over for 1960 – 77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1986."

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)

U.S. and U.S.S.R.

For selected years, 1960 to 1985

	1960	1970	1975	1979	1980	1981	1982	1983(r)	1984	1985
United States										
Million US$	$236.4	$454.1	$615.7	$990.3	NA	NA	NA	NA	NA	NA
Thousand units(b)	19.3	24.2	26.8	31.4	30.3	21.7	18.3	31.5	34.1	17.8
USSR										
Million US$	$188.3	$359.2	$581.1	$828.6	NA	NA	NA	NA	NA	NA
Thousand units	29.9	41.3	50.5	56.3	57.2	57.1	57.3	57.4	55.3	52.7

NA – Not Available. r – Revised.

(a) Power – driven metalforming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.

(b) Average value of $1,000 and over for 1960 – 77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1986."

COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)

1973 to 1977

(Millions of U.S. Dollars)

Exporting Country	Total(b)	Exported to					
		Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin America (e)
TOTAL							
1973	$ 9,143	$ 6,917	$638	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976	14,050	11,130	580	40	218	587	97
1977	15,605	12,726	665	45	250	785	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	182
1974	3,357	2,249	232	10	154	555	11
1975	3,553	2,051	252	17	136	540	22
1976	3,953	2,952	127	3	96	303	23
1977	4,759	3,538	153	3	115	28	
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1,404	128	16	54	134	35
1974	1,973	1,511	169	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	18	1	5	16	11
1974	1,002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

(a) Note that these figures are for machinery in general and not for machine tools only.

(b) Total includes Australia, New Zealand, South Africa and not specified.

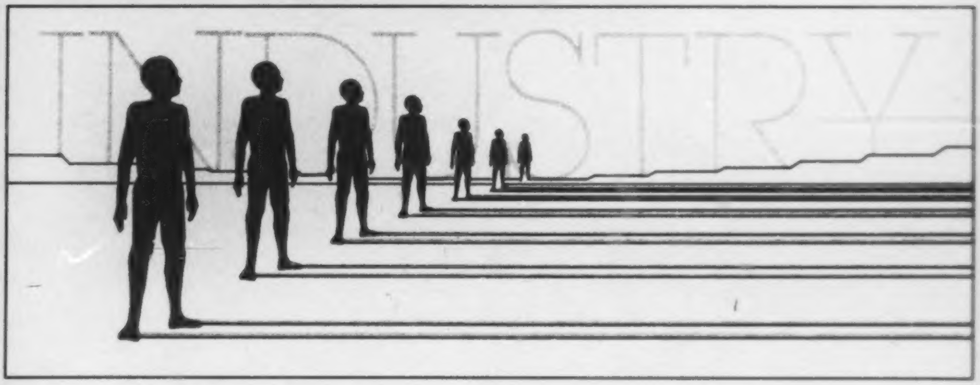
(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.

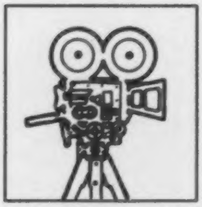
(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.

(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau – Anstalten, VDMA, "Statistisches Handbuch fur den Maschinenbau" (annually).

The future of industry depends on new employees





Put NMTBA's new career recruitment film to work for you. "Machine Tool Careers" is available *free of charge* for use in your company's personnel development efforts, as well as in local high schools and vocational schools. The informative 25-minute film is also available in video cassette.

This colorful film shows young, successful metalworking industry employees—operators, programmers, assembly technicians, service engineers and supervisors—describing their work, their career progress and their life styles. In addition, the motion picture covers what machine tools are and their importance to our nation's industrial achievements.

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7

EMPLOYMENT AND EARNINGS

Relative to total U.S. Industry, the machine tool industry is small. If all the employees of the industry were to work for a single company, it would rank only about 50*th* among U.S. industrial corporations. These employment statistics demonstrate that the industry is characterized by a substantial number of small and medium-sized establishments.

Historically, industry employment has fluctuated sharply with changes in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry. When employment has to be cut due to business slowdown, some of the highly skilled labor force is lost. Conversely, when business recovers, there is typically shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of manpower problems. The advent of computers and electronics as major components of machine tools has led to a steady shift in both the nature and composition of the industry's workforce. While skilled machininsts are still a mainstay of machine tool building operations, electronic engineers and computer professionals are becoming increasingly important.

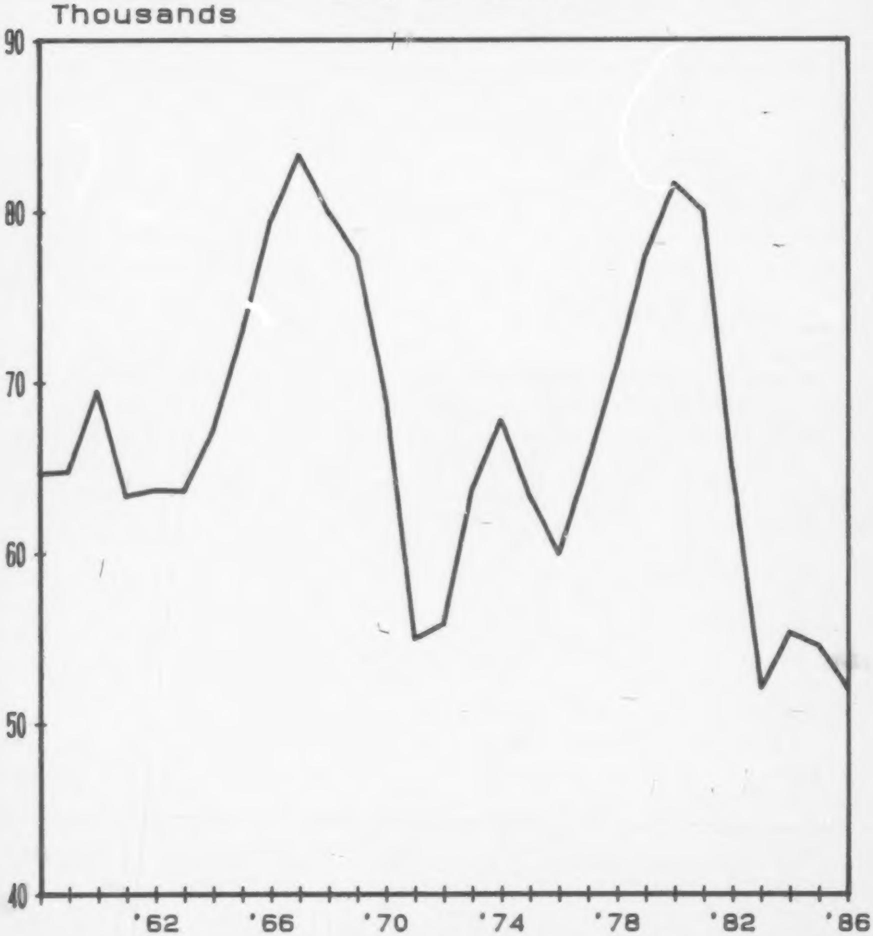
Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $11.00 in 1986. Average earnings in the metal forming sector of the industry were $11.51. The average weekly hours worked in the industry were 42.4 for the metal cutting tool builders' employees, and 41.9 for the metal forming machine tool builder's employees.

Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in the U.S. has grown more rapidly than in other countries as a result of the dollar's strengthening during the first half of the 80's. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is by far the highest among the major machine tool producing nations. U.S. wage growth should slow significantly, relative to other industrialized nations, as a result of the dollar's decline in late 1986 and throughout most of 1987.

Most of the data in this chapter comes from the U.S. Department of Labor's Bureau of Labor Statistics, primarily from their monthly "Employment and Earnings" tabulation. Some of the data is obtained from the Bureau of the Census, primarily its annual "Survey of Manufactures" series. The Census data may be more complete because it is based on the enumeration of all workers in SIC identified industries that is obtained in the "Census of Manufactures." However, as the Census comes out only every five years and the "Survey of Manufacturers" is annual, the data from the BLS offers much more timely information with only a marginal loss of accuracy. For further explanation of the terms used in this chapter, see the Glossary at the end of this book.

Employment in the Metal Cutting Machine Tool Industry
1958 to Date



EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

1958 to Date

(Average Annual Employment in Thousands)

	All Employees		Production Workers		Female Employees	
Year	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming
1958	64.7	NA	43.8	NA	6.3	NA
1959	64.8	NA	44.3	NA	6.0	NA
1960	69.5	NA	48.2	NA	6.5	NA
1961	63.3	NA	42.8	NA	5.9	NA
1962	63.7	NA	43.7	NA	5.8	NA
1963	63.6	NA	44.0	NA	5.7	NA
1964	67.1	NA	46.7	NA	5.8	NA
1965	72.8	NA	50.8	NA	6.2	NA
1966	79.4	NA	55.7	NA	7.1	NA
1967	83.3	NA	57.9	NA	7.9	NA
1968	80.0	NA	54.5	NA	7.6	NA
1969	77.4	NA	52.2	NA	7.4	NA
1970	69.2	NA	45.5	NA	6.8	NA
1971	54.9	NA	34.9	NA	5.4	NA
1972	55.8	NA	35.8	NA	5.5	NA
1973	63.7	NA	42.6	NA	6.4	NA
1974	67.8	NA	45.6	NA	7.1	NA
1975	63.3	NA	41.8	NA	6.5	NA
1976	59.9	NA	38.8	NA	6.4	NA
1977	65.2	23.3	41.9	15.4	7.3	NA
1978	70.9	25.0	45.9	16.5	8.4	NA
1979	77.4	26.9	51.2	17.7	9.7	NA
1980	81.6	26.4	54.7	17.0	10.6	NA
1981	80.0	24.4	52.0	15.3	10.7	NA
1982	64.9	21.0	39.3	12.6	8.8	2.2
1983	52.0	17.1	29.9	9.9	7.3	1.7
1984(r)	55.3	18.6	33.7	11.4	8.0	1.9
1985(r)	54.5	18.9	34.3	11.6	8.1	2.1
1986(p)	52.0	18.4	32.6	11.1	7.7	2.2

r - Revised. p - Preliminary. NA - Not Available.

Note: The figures published by the Bureau of Labor Statistics are based on monthly sample surveys and differ from the figures shown by the Census.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-85" and monthly issues.

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Machine Tool Industry
Monthly, 1984 to Date (r)

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1984	1985	1986	1984	1985	1986
Metal Cutting						
Jan.	31.4	34.8	33.8	41.6	42.8	43.0
Feb.	32.3	34.6	33.8	42.3	42.2	42.7
Mar.	32.8	34.6	33.6	42.0	42.5	42.9
Apr.	33.1	33.9	33.3	42.4	42.0	42.9
May	33.3	34.6	33.1	42.3	42.2	42.9
June	33.7	34.4	33.1	42.3	42.5	42.6
July	34.4	33.9	32.3	42.2	42.3	41.4
Aug.	33.7	34.0	32.2	42.4	42.5	41.6
Sept.	34.6	34.4	31.8	42.6	42.5	41.7
Oct.	34.9	34.0	31.5	42.6	42.6	41.7
Nov.	35.0	34.0	31.3	42.8	42.2	42.0
Dec.	35.0	34.2	31.2	43.6	45.1	43.3
Yearly Avg.	33.7	34.3	32.6	42.4	42.6	42.4
Metal Forming						
Jan.	10.7	12.0	11.3	42.1	41.4	42.4
Feb.	10.9	12.0	11.3	42.8	40.7	42.5
Mar	11.1	11.9	11.2	42.8	42.3	42.5
Apr.	11.2	11.7	11.1	42.0	41.8	42.4
May	11.3	11.7	11.2	41.5	41.4	41.7
June	11.4	11.7	11.3	42.5	42.0	41.9
July	11.2	11.6	11.0	41.7	41.3	40.9
Aug.	11.4	11.3	10.9	41.9	41.0	39.9
Sept.	11.8	11.4	10.9	42.3	42.7	41.3
Oct.	11.8	11.2	11.1	42.6	42.2	41.8
Nov.	12.0	11.3	10.8	42.8	42.8	42.5
Dec.	12.1	11.3	10.9	43.9	43.5	42.6
Yearly Avg.	11.4	11.6	11.1	42.4	41.9	41.9
Total Machine Tools Yearly Avg.	45.1	45.9	34.7	42.4	42.3	42.2

r - Revised.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-85" and monthly issues.

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1940 to Date

	Metalworking Machinery Industry			Metal Cutting Machine Tool Industry		
Year	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
1940	NA	NA	NA	$ 37.44	48.0	$ .78
1941	NA	NA	NA	44.22	51.6	.86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$ 1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.01	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.90	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.89	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979	329.30	43.5	7.57	344.21	44.3	7.77
1980	346.83	42.4	8.18	366.21	43.7	8.38
1981	371.90	41.6	8.94	383.95	42.1	9.12
1982	380.09	39.8	9.55	380.44	38.9	9.78
1983	399.67	40.7	9.82	386.49	39.0	9.91
1984(r)	436.29	42.9	10.17	432.48	42.4	10.20
1985(r)	450.08	42.5	10.59	451.13	42.6	10.59
1986	467.25	42.4	11.02	466.40	42.4	11.00

r - Revised. NA - Not Available.

Note: Earnings figures include overtime and premium pay.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-85" and monthly issues.

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS

Selected Industry Groups, 1940 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1940	$ 28.07	NA	$ 36.69	NA	NA	$ 37.44
1941	33.56	NA	42.68	NA	NA	44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.34	61.33	59.23
1950	62.43	67.08	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.38	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.18	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979	290.90	305.98	372.37	351.05	329.30	344.21
1980	310.78	328.00	394.00	389.76	346.83	366.21
1981	343.31	360.33	450.72	425.80	371.90	383.95
1982	355.27	367.62	470.61	461.55	380.09	380.44
1983	382.17	386.78	525.66	486.98	399.67	386.49
1984(r)	403.24	417.32	557.57	516.21	436.29	432.48
1985(r)	416.12	427.04	583.77	532.56	450.08	451.13
1986	424.98	439.30	577.30	552.12	468.90	466.40

r - Revised. NA - Not Available.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-85" and monthly issues.

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS

Selected Industry Groups, 1940 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1940	$ .72	NA	$ .94	NA	NA	$ .78
1941	.80	NA	1.04	NA	NA	.86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$ 1.34	1.47	$ 1.37	$ 1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.48	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	2.70	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.08	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978	6.58	6.78	8.50	7.54	7.02	7.20
1979	7.13	7.32	9.06	8.26	7.57	7.77
1980	7.75	8.00	9.85	9.28	8.18	8.38
1981	8.54	8.81	11.02	10.31	8.94	9.12
1982	9.04	9.26	11.62	11.23	9.55	9.78
1983	9.39	9.55	12.14	11.82	9.82	9.91
1984(r)	9.74	9.96	12.73	12.32	10.17	10.20
1985(r)	10.10	10.29	13.42	12.62	10.59	10.59
1986	10.29	10.56	13.52	12.90	11.02	11.00

r - Revised. NA - Not Available.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-85" and monthly issues.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

Region and Survey Year	Occupation				
	Machine Tool Operators, Production				
	Class A (b)	Class B (c)	Class C (d)	Numerically Controlled	Tool Room One Type Machine
1. Baltimore, Md.					
Jan. 1978	$ 6.74	$ 5.79	$ 5.24	$ 5.67	$ 6.54(e)
Jan. 1981	9.01	7.84	7.01	8.45	NA
Nov. 1983	10.65	9.61	7.83	10.25	NA
2. Boston, Mass.					
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.71	NA
Nov. 1983	10.99	10.16	NA	9.99	NA
3. Buffalo, N.Y.					
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.77
Nov. 1983	10.06	8.15	7.29	11.24	10.92
4. Chicago, Ill.					
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.68	11.12
Nov. 1983	11.50	9.28	8.39	11.03	12.63
5. Cleveland, Ohio					
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.41	9.68
Nov. 1983	10.15	8.92	7.10	10.40	10.67
6. Denver, Colo.					
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.61	10.68
Nov. 1983	10.41	7.92	5.83	10.26	11.32
7. Detroit, Mich.					
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.98	11.98
Nov. 1983	12.70	10.92	9.58	11.61	12.39
8. Houston, Tx.					
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	8.96	5.93	10.25	10.47
Nov. 1983	11.56	9.71	9.68	11.86	11.55
9. L.A.-Long Beach, Cal.					
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.39	4.83	9.79	9.70
Nov. 1983	12.71	8.38	NA	14.72	12.46
10. Milwaukee, Wis.					
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	10.63
Nov. 1983	11.71	11.37	10.22	12.06	11.89
11. Newark, N.J.					
Jan. 1978	6.50	6.59	4.85	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	9.25
Nov. 1983	9.83	9.38	5.31	10.54	10.45
12. Pittsburgh, Pa.					
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.38	NA
Nov. 1983	10.53	8.89	7.48	11.46	10.13
13. St. Louis, Mo.-Ill.					
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69
Nov. 1983	11.63	9.20	7.27	11.36	12.00

NA - Not Available.

(a) Nonelectrical Machinery (SIC 35).

(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.

(c) Operators who set up their own machines and maintain operation set-ups made by others.

(d) Operators who perform routine and repetitive operations but do not set up machines.

(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.	$ 6.03	$ 5.71	$ 6.72	NA	$ 5.13	$ 5.38
	8.00	6.88	8.88	$ 7.72	7.21	NA
	11.00	7.10	11.45	8.04	5.96	NA
2.	6.18	4.89	NA	5.26	4.56	5.73
	8.31	5.62	8.47	7.44	6.18	7.22
	9.14	7.24	10.01	8.53	6.54	9.26
3.	6.92	5.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
	10.36	10.27	10.95	9.54	8.66	8.36
4.	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
	11.01	8.93	11.54	10.11	8.35	10.15
5.	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
	11.02	7.43	10.99	9.09	8.90	10.13
6.	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
	9.53	7.05	9.82	NA	NA	NA
7.	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
	12.47	11.23	12.33	10.75	10.50	11.59
8.	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
	10.89	10.77	11.57	11.22	9.15	9.20
9.	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.24	5.74	6.93
	10.15	7.29	11.90	7.10	8.45	9.15
10.	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	10.05	10.45	9.91	9.24	10.12
	11.45	10.76	11.82	10.92	10.51	10.95
11.	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	7.82
	9.47	8.04	9.60	8.27	6.36	9.09
12.	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
	9.74	7.63	11.22	10.50	9.68	10.08
13.	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86
	11.49	8.73	10.58	9.44	8.05	9.22

NA - Not Available.

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.

(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.

(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.

(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Selected Years, 1937 to Date

	Machine Tool Total		Metal Cutting		Metal Forming	
Year	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,487	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,056	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112,200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977	83,100	53,300	59,400	37,200	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979	96,100	64,400	69,100	45,700	27,000	18,700
1980	99,700	66,000	72,800	47,800	26,900	18,200
1981	98,300	63,900	74,300	47,900	24,000	16,000
1982	77,800	46,000	58,300	33,900	19,500	12,100
1983	58,300	34,100	43,000	24,500	15,300	9,600
1984(r)	58,500	35,200	42,400	24,700	16,100	10,500
1985	67,700	29,200	42,800	17,700	24,900	11,500
1986E	64,600	27,900	40,800	16,900	23,800	11,000

NA - Not Available. E - Estimated by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years, 1960 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1970	100,200	965.3	65,900	136.6	572.6
1971	78,400	774.6	49,200	97.4	428.7
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977	83,100	1,309.7	53,300	109.1	760.1
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7
1981	98,300	2,129.8	63,900	129.3	1,259.0
1982	77,800	1,773.1	46,000	86.8	954.5
1983	58,300	1,354.1	34,100	63.7	708.1
1984	58,500	1,460.9	35,200	67.2	784.4
1985	60,500	1,589.2	36,400	70.7	868.0

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years, 1960 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$152.1	17,952	35.8	$100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1970	28,900	280.6	20,100	43.4	177.3
1971	24,400	241.5	16,000	32.9	142.5
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978	25,200	415.6	17,000	35.1	253.2
1979	27,000	485.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2
1981	24,000	496.8	16,000	30.8	294.9
1982	19,500	438.1	12,100	23.2	245.3
1983	15,300	357.0	9,600	17.8	196.0
1984	16,100	407.0	10,500	20.7	242.7
1985	17,700	461.6	11,500	23.0	275.4

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Machine Cutting Machine Tool Industry
1937 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	33,997	NA	62.9
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.6	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	486.8
1976	58,100	845.4	37,600	73.5	473.9
1977	59,400	949.0	37,200	76.3	540.7
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5
1981	74,300	1,633.0	47,900	98.5	964.1
1982	58,300	1,335.0	33,900	63.6	709.2
1983	43,000	997.1	24,500	45.9	512.1
1984	42,400	1,053.9	24,700	46.5	541.7
1985	42,800	1,127.6	24,900	47.7	592.6

NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

SELECTED LABOR RATIOS
1963 to Date

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod. Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1963	$ 7,171	67%	2,109	$ 3.14	$11,445	62%	$ 8.08
1964	7,645	68	2,186	3.15	12,844	59	8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,438	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,179	3.62	15,955	55	10.56
1968	8,958	68	2,090	3.85	16,336	55	11.46
1969	9,584	67	2,098	4.12	17,452	55	12.43
1970	9,603	64	2,035	4.24	15,597	62	11.93
1971	9,872	61	1,943	4.44	15,181	65	12.71
1972	10,930	64	2,042	4.78	17,175	64	13.22
1973	11,843	66	2,093	5.02	20,269	58	14.58
1974	13,452	68	2,107	5.51	24,877	54	17.48
1975	13,540	65	2,002	5.96	26,119	52	20.07
1976	14,551	64	1,955	6.45	28,642	51	22.64
1977	15,976	63	2,051	7.09	31,416	51	24.46
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980	20,659	66	2,067	9.00	46,005	45	33.90
1981	21,978	64	2,056	9.79	50,335	44	37.97
1982	22,899	58	1,876	11.15	43,160	53	39.56
1983	23,188	57	1,873	11.16	37,505	62	35.13
1984	24,856	58	1,883	11.65	42,925	58	39.14
1985	26,346	58	1,916	12.42	46,729	56	41.93
METAL FORMING MACHINE TOOL INDUSTRY							
1963	$ 7,316	71%	2,189	$ 3.10	$12,728	57%	$ 8.13
1964	7,839	72	2,289	3.20	13,847	56	8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,287	3.46	15,214	56	9.11
1967	8,548	72	2,211	3.57	14,973	57	9.46
1968	8,810	70	2,211	3.67	16,247	54	10.57
1969	9,664	69	2,186	4.06	16,182	60	10.69
1970	9,709	70	2,159	4.09	16,249	60	10.82
1971	9,898	68	2,056	4.33	14,914	66	11.06
1972	11,012	69	2,090	4.72	17,332	64	12.04
1973	11,985	70	2,212	4.91	20,241	59	13.07
1974	12,786	70	2,133	5.50	21,852	59	14.64
1975	13,196	68	2,023	5.82	23,781	55	17.27
1976	14,707	69	2,013	6.69	27,122	54	19.41
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	67	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	46	26.77
1980	19,112	68	1,934	8.90	38,740	49	29.61
1981	20,700	67	1,925	9.57	40,688	51	31.70
1982	22,467	62	1,917	10.57	39,887	56	33.53
1983	23,333	63	1,854	11.01	41,150	57	35.37
1984	25,280	65	1,971	11.72	48,193	52	37.48
1985	26,079	65	2,000	11.97	52,723	49	40.57

Sources: 1963, 1967, 1972, 1977, 1982: U.S. Bureau of the Census, "Census of Manufactures," 1982, Industry Series: "Metalworking Machinery and Equipment," MC 82–1–35C and earlier years. Other Years: U.S. Bureau of the Census, "Annual Survey of Manufactures."

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS
Selected Industry Groups, 1961 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Industry	Metalworking Machinery Industry
1961	2.4	2.3	2.5	3.4
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979	3.3	3.5	4.0	5.7
1980	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1
1982	2.3	2.2	2.2	2.7
1983	3.0	3.0	2.7	3.3
1984	3.4	3.6	3.7	4.9
1985	3.3	3.5	3.4	4.6
1986	3.4	3.5	3.4	4.6

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings," monthly and annual supplements.

WORK INJURY RATES
By Industry, 1985

Industry	Incidence Rates (per 100 Employees)			Average Lost Workdays Per Lost Workday Case
	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	
Manufacturing	10.4	4.6	5.8	17.4
Fabricated Metal Products	16.3	6.9	9.4	16.0
Metal Forgings and Stampings	15.9	6.7	9.1	16.1
Machinery Except Electrical	10.8	4.2	6.6	16.5
Engines and Turbines	9.4	4.1	5.3	18.7
Construction and Related Machinery	13.3	5.7	7.6	16.3
Metalworking Machinery	12.1	4.2	7.9	16.2
Machine Tools, Metal Cutting Types	9.3	3.3	6.0	15.8
Machine Tools, Metal Forming Types	13.8	5.9	7.9	14.7
Special Industry Machinery	13.6	4.9	8.7	14.9
General Industrial Machinery	12.3	4.8	7.5	16.9
Transportation Equipment	9.0	3.9	5.0	18.4
Motor Vehicles and Equipment	9.2	4.1	5.1	17.0

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

AVERAGE HOURLY EARNINGS AND SUPPLEMENTARY LABOR COST

In the Machine Tool Industry of the United States and Seven Foreign Countries

Country	Date	Industry	Workers Covered	Average Hourly Earnings	Estimated Supplementary Labor Cost	Total Compensation
Sweden	1985	(3)	P.W.	$ 5.60	$3.83	$ 9.43
France	1985	(3)	P.W.	4.40	3.64	8.04
Germany (Federal Republic)	1985	(3)	P.W.	5.84	4.19	10.03
Italy	1983	(3)	P.W.	4.16	3.77	7.93
Switzerland	1985	(2)	P.W.	7.30	2.70	10.00
United Kingdom	1985	(3)	P.W.	4.80	1.57	6.37
Japan	1985	(1)	P.W.	6.58	1.08	7.66
United States	1985	(1)	P.W.	10.59	3.61	14.20

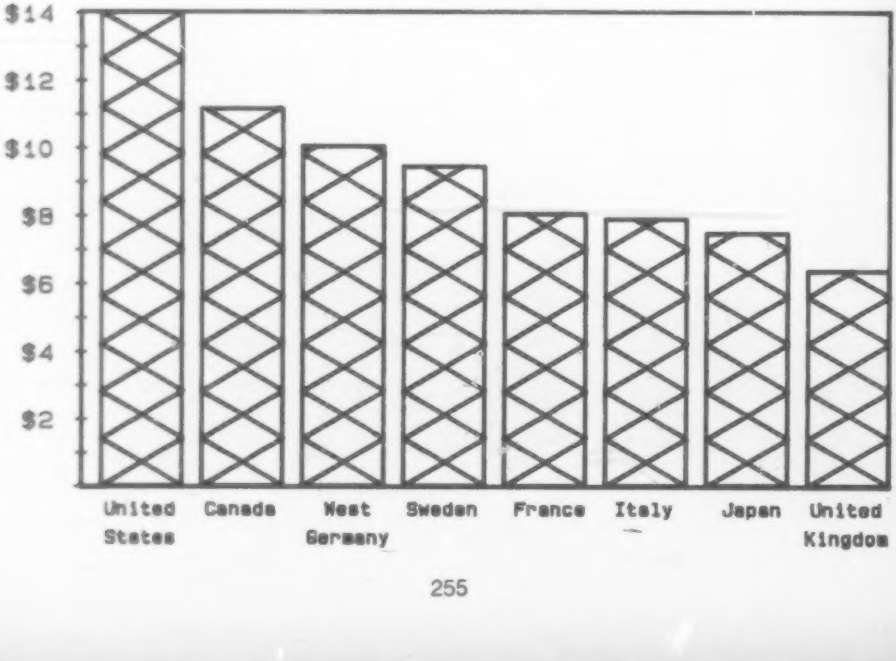
P.W. - Production Workers.

(1) Machine Tools.
(2) Metals and Machines.
(3) Non-Electrical Machinery.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons.

This table differs from the one shown in chapter 2 because if focuses directly on the machine tool industry compensation. The other table shows production woker compensation in manufacturing as a whole.

Average Hourly Compensation
of Production Workers
Machinery, Except Electrical, 1985



AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES

In Selected Countries, 1981 to Date

County	Industry	1981	1982	1983	1984(r)	1985	Percent Change 1981–85
Canada	(1)	$8.25	$8.75	$9.13(b)	$8.79	$ 8.54	3.5%
France	(1)	5.15	4.88	4.68	4.32	NA	NA
Italy	(1)	5.13	4.99	NA	NA	NA	NA
Japan	(1)	7.32	6.84	7.27	7.51	7.67	4.8
Switzerland (a)	(2)	8.11	8.38	8.40	7.69	7.58	−6.5
United Kingdom	(1)	5.84	5.50	5.02	4.73	5.00	−14.4
United States	(1)	8.81	9.26	9.55	9.96	10.39	17.9
West Germany	(1)	6.48	6.32	6.21	5.72	5.84	−9.9

r - Revised. NA - Not Available.

(a) Men only.
(b) Ten month average.
(1) —Machinery, except electrical.
(2) —Basic metal and fabricated metal products.

Sources: "ILO 1986 Statistical Yearbook" ("Statistics of average earnings ... usually cover cash payments received from employers, i.e., remuneration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums ...").

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS

In Selected Industry Groups, 1985 (a)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$12.82	$13.99	$12.41	$19.73
Canada	10.89	11.15	10.42	13.10
France	7.71	8.04	7.38	8.61
West Germany	9.60	10.03	9.94	12.17
Italy	7.65	7.88E	7.26	8.05
Japan	6.45	7.48	5.78	8.04(b)
Sweden	9.66	9.43	8.79	10.14
United Kingdom	6.14	6.37	5.48	7.07

E - Estimated by NMTBA.

(a) Preliminary estimates.
(b) Includes motorcycle manufacturing.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

8

FINANCE

Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite figures are based on a weighted average of individual company data. Prior to 1980, six companies formed the basis of the composite. Since 1980, only five firms have been included. However, since the figures presented are weighted according to the total market value of equity stock outstanding in these firms, comparisons between data before and after 1980 should prove valid.

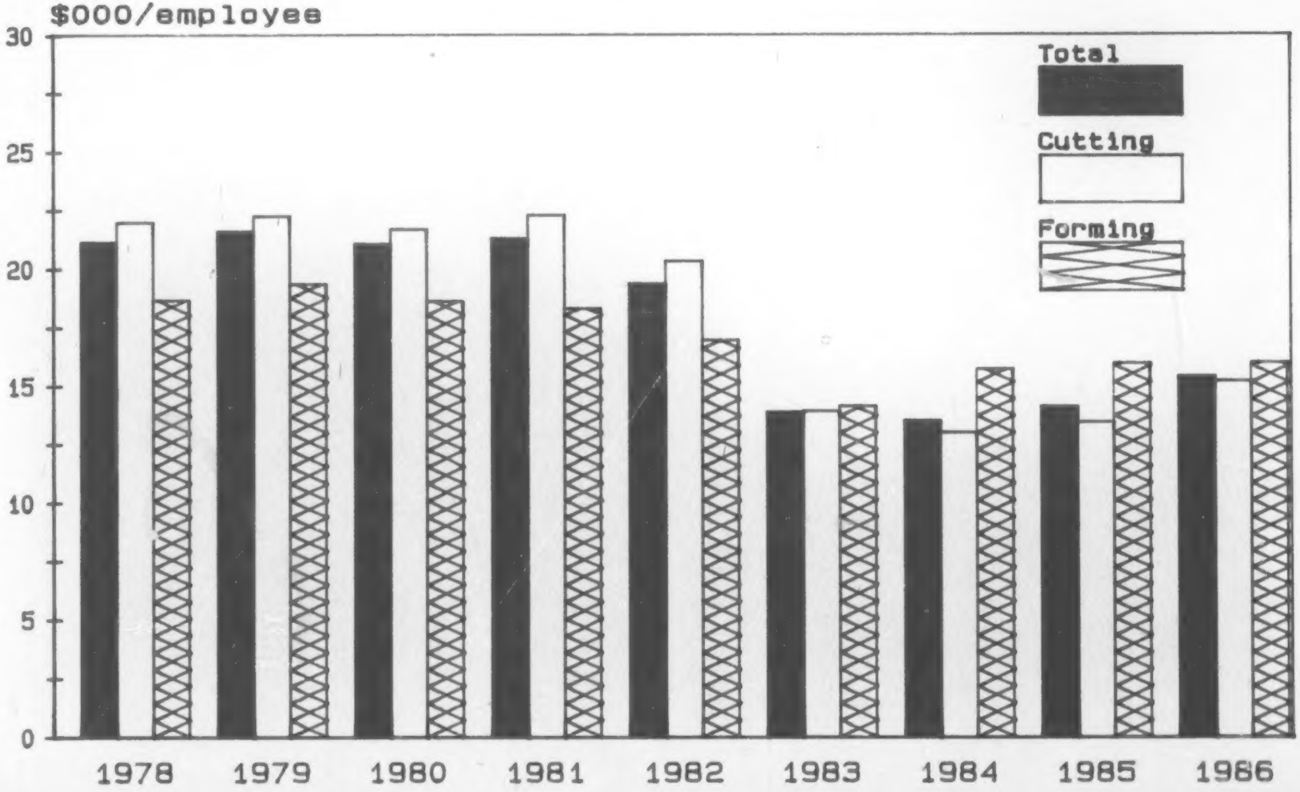
Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941—1943 = 10 to 1967 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, an inflationary environment leads to the overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.

Machine Tool Industry Productivity

(Constant Dollar Shipments per Production Worker)



SELECTED FINANCIAL RATIOS FOR CORPORATIONS
IN SELECTED INDUSTRIES, 1986

Industry	% Net Operating Profit on Sales	% Earnings After Taxes On Sales	% Earnings After Taxes On Net Worth	% Depreciation and Amortization On Net Sales	Times Inventory Turnover	Current Assets to Current Liabilities
Machine Tools	1.3%	(a)	(a)	2.7%	3.3	2.2
All Manufacturing Corporations	5.6	3.7%	9.6%	4.2	6.8	1.5
Durable Manufactures	4.8	2.9	7.8	3.9	5.7	1.6
Electrical Machinery	5.0	3.8	8.8	3.9	5.1	1.7
Machinery, Except Electrical	4.2	3.3	6.2	4.4	5.1	1.8
Motor Vehicles	4.0	4.3	15.2	4.1	12.2	1.3
Chemical and Allied Products	7.5	6.2	12.7	4.8	6.7	1.5

(a) - Net income after taxes was less than 0.5%.

Source: U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)
Machine Tool Industry, 1967 to Date
(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1967	$1,099	$ 800	$245	$ 555	$299	$ 88	$211
1968	1,161	845	253	592	316	94	222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977	1,498	1,044	310	734	454	133	321
1978	1,698	1,180	340	840	518	145	373
1979	1,892	1,336	383	953	556	155	401
1980	2,052	1,469	416	1,053	583	164	420
1981	2,324	1,599	449	1,150	725	205	520
1982	2,435	1,692	475	1,217	743	203	541
1983	2,316	1,677	472	1,205	639	176	464
1984	2,233	1,638	467	1,171	595	165	430
1985	2,289	1,632	461	1,172	657	181	476

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Census of Manufactures," 1967, 1972, 1977, 1982, 1983, 1985; U.S. Bureau of the Census, "Annual Survey of Manufactures."

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1954	NA	$ 37.7	$11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.8	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9
1981	296.2	233.2	52.3	180.9	63.0	12.8	50.2
1982	190.3	152.2	32.8	119.4	38.1	4.3	33.8
1983	132.9	104.8	18.6	86.2	28.1	4.6	23.5
1984	139.8	108.8	19.2	89.7	31.0	3.8	27.3
1985	135.3	91.6	14.6	77.0	43.7	9.3	34.4

NA - Not Available.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

NOTE: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufactures," 1963, 1967, 1972, 1977, 1982, 1983, 1985; U.S. Bureau of the Census, "Annual Survey of Manufactures."

MACHINE TOOL FINANCIAL INDICATORS (a)

Per Share Data

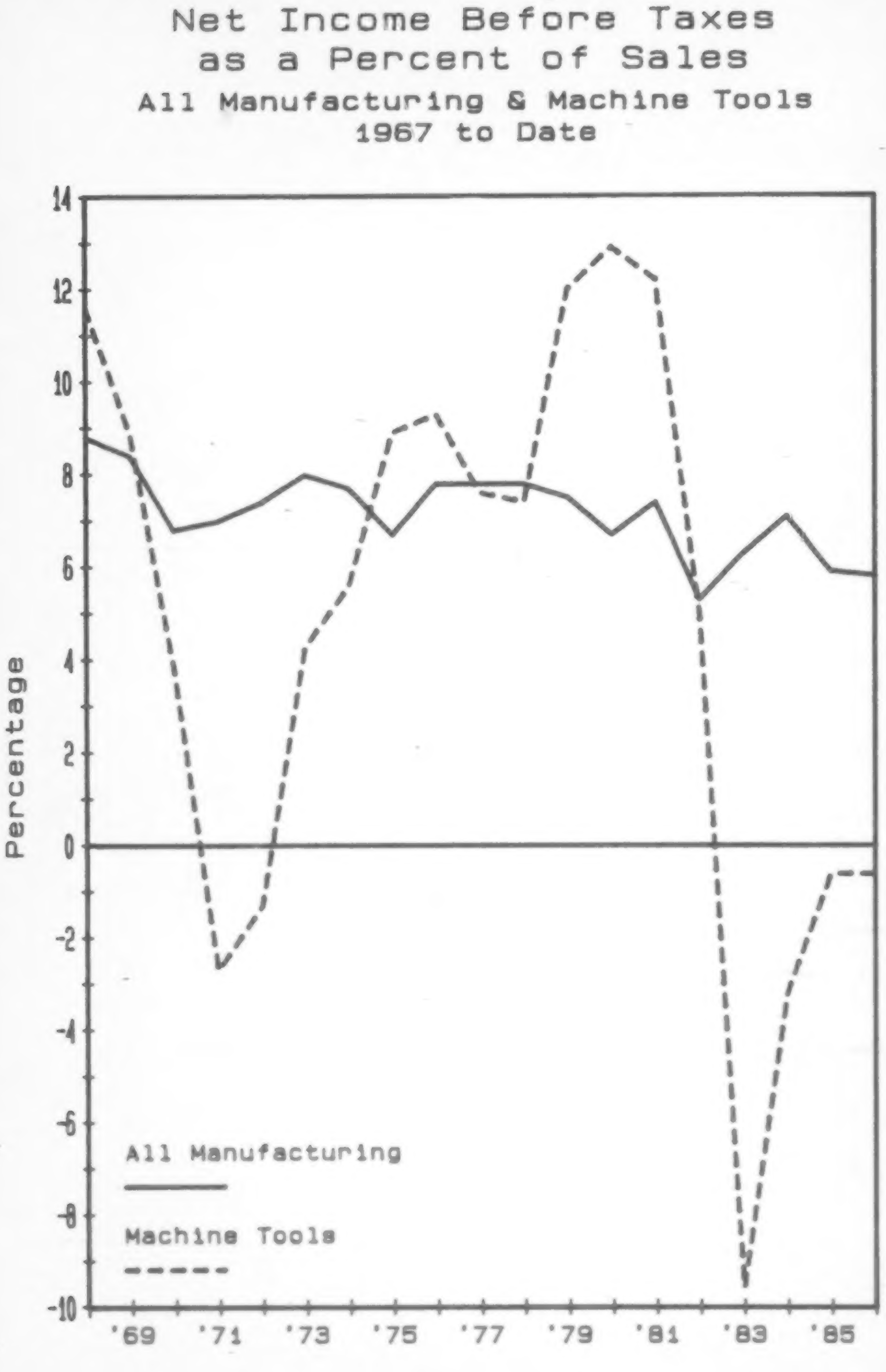
(1967 = 100)

Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	73.4	66.0	45.8	75.3	67.1	90.7
1957	67.9	53.3	50.9	78.8	71.0	67.2
1958	42.6	14.9	52.4	77.4	70.3	51.4
1959	46.3	15.7	53.8	75.5	68.0	42.5
1960	54.8	26.5	56.6	75.6	65.8	61.1
1961	54.1	29.3	56.1	76.4	67.6	45.3
1962	59.6	28.4	50.9	77.8	70.1	44.9
1963	61.7	37.2	58.0	80.0	72.2	61.9
1964	64.9	57.1	66.0	74.5	66.1	95.1
1965	77.2	70.1	73.6	81.6	82.2	103.2
1966	92.9	88.7	84.4	90.2	92.1	142.5
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	99.0	100.3	117.5	106.9	101.7	167.6
1969	100.7	87.6	118.9	110.2	103.6	156.7
1970	89.7	42.4	120.8	110.1	107.7	122.3
1971	73.4	16.2	112.7	108.0	101.9	93.9
1972	88.4	32.2	111.8	106.2	104.7	150.6
1973	119.4	73.1	116.0	111.8	107.4	217.8
1974	145.0	81.4	124.5	116.5	153.2	247.8
1975	156.6	82.7	136.8	120.5	159.6	176.5
1976	146.9	79.0	142.5	124.8	154.1	156.3
1977	167.2	114.5	151.9	132.5	158.1	208.9
1978	197.7	165.5	157.1	149.2	169.9	248.2
1979	237.5	234.4	177.6	177.8	190.0	371.7
1980	309.2	277.9	218.4	226.8	263.4	542.6
1981	331.1	284.3	259.0	254.7	272.0	489.4
1982	320.2	207.3	334.4	NA	267.4	541.0
1983	200.6	5.4	361.8	272.3	256.4	321.7
1984	236.9	81.9	356.6	273.7	249.7	512.6

NA – Not Available.

(a) Data in this table prior to 1980 represents a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time. Since 1980, the composite has included five companies. However, since the indicators are weighted according to the market value of shares outstanding, a shift in the composite's composition should not affect the indicators. Therefore, pre- and post-1980 data are comparable.

Source: Standard & Poor's Corporation, Data in original form, 1941–43 equals 10, taken from "Industry Surveys," a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.


Net Income Before Taxes
as a Percent of Sales
All Manufacturing & Machine Tools
1967 to Date
Percentage
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
'69
'71
'73
'75
'77
'79
'81
'83
'85
All Manufacturing
Machine Tools

AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

1967 to Date

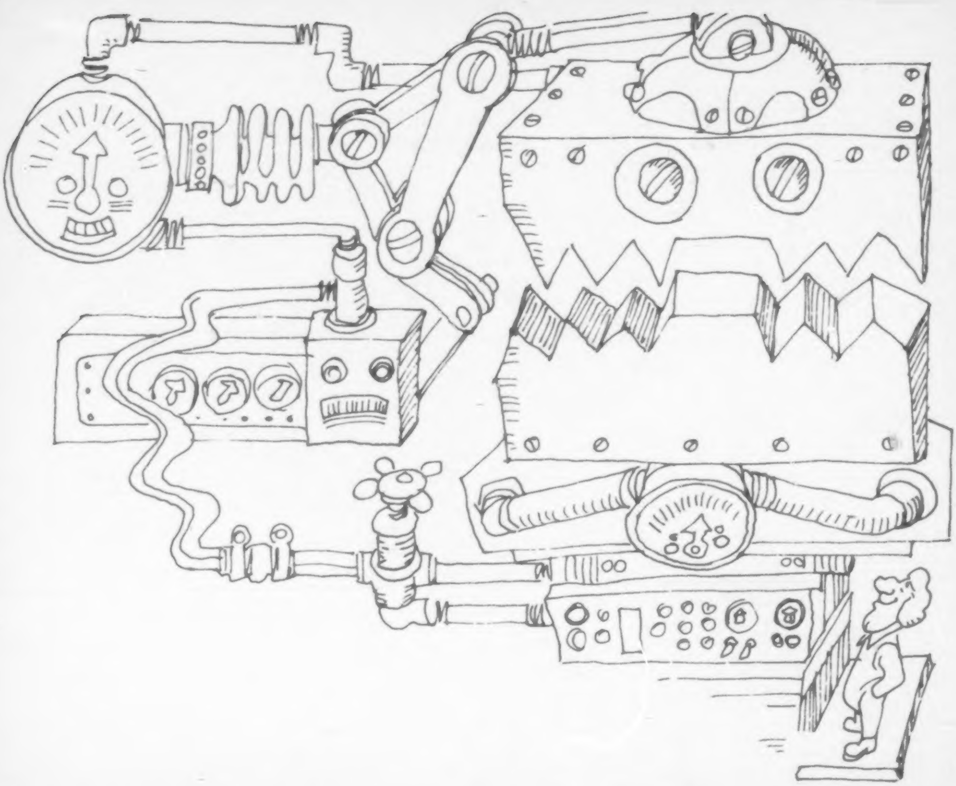
	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
Year	All Manufacturers	Machine Tool Manufacturers (a)	All Manufacturers	Machine Tool Manufacturers
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.7	12.9	9.5	19.4
1981	7.4	12.2	10.5	18.0
1982	5.3	5.0	6.7	6.1
1983	6.3	(9.6)	7.9	(8.7)
1984	7.1	(3.2)	8.9	(3.4)
1985	5.9	(0.6)	7.1	(0.7)
1986	5.8	(0.6)	6.5	(b)

(a) Data based on the machine tool activities of 111 companies and divisions.

(b) Net income before taxes was less than 0.1%.

Note: Figures in parentheses represent negative figures.

Sources: National Machine Tool Builders' Association, U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).



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MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years - a total of 13 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

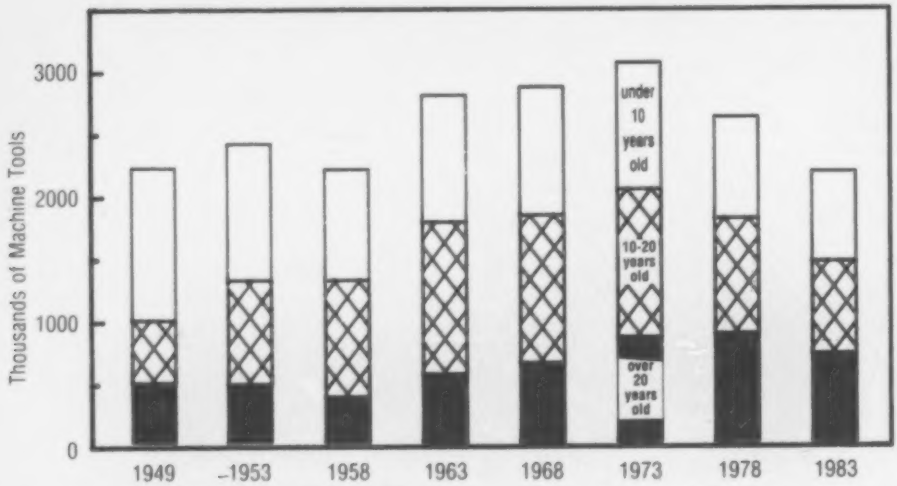
Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. The latest Inventory, the 13th of the series, returned to the format employed in the first eleven, i.e. surveying all metalworking industries in one year. The 13th Inventory was conducted in 1983 and its results were published late in the year. All of the tables and charts in this chapter have been updated to reflect this latest compilation.

The American Machinist Inventory is based on a sample survey and it is the nature of such surveys that the reliability of the data is greatest in the broader categories. The survey's reliability necessarily decreases as results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas." Another limitation is the coverage of the survey. While the data compiled are believed to accurately reflect the number and types of machine tools in use in U.S. metalworking industries, the user should be aware of the sample's limitations. For all but the 12th Inventory, all of metalworking manufacturing was surveyed to arrive at tabulated results. In the 12th Inventory, estimates were made for metalworking plants with fewer than twenty employees as these establishments were not surveyed. Tables containing these estimates are so noted. Secondly, the coverage of the survey is based on employment totals, not the number of plants. For example, in the 1983 Inventory, the number of plants responding to the survey comprised only 7% of the total number of establishments with more than twenty employees recognized by the U.S. Bureau of Census. However, this 7% represented an employee base of approximately 25% of metalworking employment. This level of representation bolsters the survey's reliability.

Also included in this chapter is a chart of Inventory data showing the number of machine tools in use in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

Additional information concerning the American Machinist Inventory may be obtained from Manufacturing Research Institute of American Machinist, 1221 Avenue of the Americas, New York, New York 10020.

Machine Tools in Use in Metalworking Industries



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1983

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	2,896,754	2,247,833	648,921
Metalworking Industries (a)	2,192,754	1,702,833	489,921
Other Industries	380,000	275,000	105,000
Training	74,000	70,000	4,000
In Storage and Surplus	250,000	200,000	50,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precisioninstruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE
Metalworking Industries,1963 to 1983
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10–19 Years		Over 20 Years			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	28.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (a, b)									
All Metalworking	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.9	3.1
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
1983 (b)									
All Metalworking	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Non-Electrical Machy.	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machy.	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.

Source: McGraw Hill, Inc. "American Machinist," Inventories of Metalworking Equipment, 1963 - 1983.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS
By Number and Age
(Number in Thousands)

			Percent of Total		
Country	Year	Total	Under 10 Years	10–19 Years	20 Years & Up
United States	1983	2,193	32.7%	34.0%	33.2%
West Germany (a)	1980	1,250	34.0	18.0	48.0
United Kingdom (b)	1982	775	42.3	30.5	27.2
Japan(c)	1981	918	36.4	28.0	35.6
France	1980	761	35.0	33.0	32.0
Italy (d)	1975	541	38.1	33.9	28.0
Canada	1978	211	35.8	30.4	33.8

(a) Machine tool age classifications are as follows: Under 10 Years, 10 to 14 Years, 15 Years & Up.
(b) Machine tool age classifications are as follows: Under 6 Years, 6 to 19 Years, 20 Years & Up.
(c) Machine tool age classifications are as follows: Under 8 Years, 8 to 12 Years, 20 Years & Up.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist."

MACHINE TOOLS IN USE
Metalworking Industries, 1983
(Number in Thousands and Percent of Industry Total)

		By Age						With Numerical Control	
		Under 10 Years		10–19 Years		20 Years and Over			
Industry	Total	Number	%	Number	%	Number	%	Number	%
TOTAL	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Metal Furniture, Fixtures	26.6	6.9	26.0	11.3	42.3	8.4	31.7	0.6	2.3
Primary Metals	117.8	34.4	29.2	39.6	33.6	43.8	37.2	2.7	2.3
Fabricated Metal Products	518.9	149.4	28.8	179.3	34.5	190.3	36.7	14.5	2.8
Fab. Structural Metal Product	120.3	41.7	34.7	42.1	35.0	36.5	30.3	4.3	3.6
Screw Machine Products	85.7	21.6	25.2	31.3	36.5	32.8	38.3	1.4	1.6
Metal Stampings	96.2	23.6	24.6	32.3	33.6	40.3	41.9	1.9	1.9
Other Fab. Metal Products	216.8	62.4	28.8	73.6	33.9	80.8	37.3	6.9	3.2
Non-Electrical Machinery	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machinery	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9
Special Industry Machy.	80.4	24.1	29.9	27.1	33.8	29.2	36.3	4.0	5.0
General Industrial Machy.	110.0	31.9	29.0	39.5	35.9	38.6	35.1	5.8	5.3
Other Non-Elec. Machy.	412.9	155.3	37.6	137.6	33.3	120.0	29.1	30.9	7.5
Electrical Machinery	245.7	85.3	34.7	90.9	37.0	69.4	28.3	10.8	4.4
Elec. Industrial Apparatus	41.4	13.8	33.2	15.0	36.3	12.6	30.5	1.8	4.3
Communications Equipment	36.6	14.0	38.4	13.6	37.1	9.0	24.5	2.6	7.1
Other Elec. Machinery	167.7	57.5	34.3	62.3	37.2	47.8	28.5	6.4	3.8
Transportation Equipment	303.0	89.0	29.4	92.7	30.6	121.2	40.0	15.3	5.0
Motor Vehicles Equip.	153.2	38.9	25.4	46.8	30.5	67.6	44.1	4.1	2.7
Aircraft and Parts	97.7	34.2	35.0	33.3	34.1	30.2	30.9	8.8	9.0
Other Trans. Equip.	52.0	15.9	30.6	12.6	24.2	23.5	45.2	2.4	4.6
Precision Instruments	109.6	41.3	37.7	40.0	36.5	28.3	25.8	4.9	4.4
Misc. Mfg. Industries	65.9	26.2	39.7	20.2	30.7	19.5	29.6	2.1	3.2

Note: Individual items may not add to totals due to rounding.

Source: American Machinist, "The 13th American Machinist Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major User Industry, 1983
(Number in Thousands)

	Total Machine Tools		Metal Cutting Machines		Metal Forming Machines	
Using Industry	Number	%	Number	% Under 10 Yrs. Old	Number	% Under 10 Yrs. Old
TOTAL	2,192.8	100.0%	1,702.8	34%	489.9	27%
Furniture & Fixtures	26.6	1.2%	10.8	34%	15.9	21%
Primary Metals Industries	117.8	5.4	88.5	30	29.3	29
Fabricated Metal Products	518.9	23.7	326.0	32	192.9	25
Ordnance & Accessories	24.3	1.1	20.7	20	3.7	18
Non-Electrical Machinery	805.3	36.7	714.8	36	90.5	30
Electrical Machy. & Equipment	245.7	11.2	177.9	36	67.7	31
Transportation Equipment	303.0	13.8	248.6	30	54.4	27
Precision Instruments	109.6	5.0	91.3	38	18.3	33
Miscellaneous Mfg. Industries	65.9	3.0	45.0	47	20.9	23

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1983

(By Number and Age Distribution)

Region and Area	Metal Cutting Machines Total Units	Metal Cutting Machines 0–4 Years	Metal Cutting Machines 5–9 Years	Metal Cutting Machines 10–19 Years	Metal Cutting Machines 20 Years & Over	Metal Forming Machines Total Units	Metal Forming Machines 0–4 Years	Metal Forming Machines 5–9 Years	Metal Forming Machines 10–19 Years	Metal Forming Machines 20 Years & Over	No. Units with NC Cutting	No. Units with NC Forming	% Plants with NC Turning	% Plants with NC Mach. ctrs.	% Plants with NC Punching
U.S.A.	1,702,833	14%	20%	34%	32%	489,921	9%	18%	36%	37%	94,012	9,296	26%	19%	8%
NORTHEAST															
Boston	101,472	15%	21%	33%	32%	27,531	9%	18%	34%	39%	5,641	504	28%	20%	8%
Bridgeport-Hartford	67,581	14	18	34	34	16,389	9	17	36	39	3,893	197	28	24	3
New York-Newark	120,299	15	22	35	28	38,954	10	18	37	35	6,707	936	18	16	6
Buffalo-Syracuse	49,202	12	18	33	37	11,713	9	17	34	41	2,375	154	31	23	10
Philadelphia-Camden	77,535	14	21	34	32	25,286	9	18	35	37	4,057	490	28	19	8
Pittsburgh-Wheeling	47,239	12	20	33	35	13,634	7	16	33	44	2,390	192	31	23	7
SOUTHEAST															
Baltimore	14,065	13	20	34	34	4,212	8	18	35	39	592	86	23	14	14
Richmond	61,169	14	19	35	32	17,231	9	18	38	35	3,340	352	32	23	11
Atlanta-New Orleans	112,738	15	20	33	32	36,520	10	18	36	35	6,362	866	22	13	8
MIDWEST															
Cleveland	75,272	13	19	34	34	21,717	8	17	35	40	3,827	269	27	18	5
Toledo	21,624	10	17	32	40	6,632	7	15	36	42	841	55	27	18	10
Cincinnati-Louisville	57,956	13	19	34	35	16,496	8	16	37	39	2,868	241	29	22	9
Detroit	106,983	13	18	32	37	27,936	8	16	34	42	5,134	319	24	18	3
Indianapolis	45,936	12	18	34	36	14,234	8	16	34	41	1,920	190	28	13	5
Chicago	218,646	13	20	34	32	68,100	9	18	36	37	12,336	1,333	23	16	9
Milwaukee	60,777	12	19	34	35	15,879	8	18	36	38	3,210	260	26	21	9
Minneapolis-St. Paul	34,421	13	21	35	31	9,613	9	18	37	36	1,703	189	31	21	11
St. Louis	49,624	13	20	35	33	18,373	9	17	37	37	1,979	295	21	14	10
SOUTHWEST															
Kansas City - Tulsa	41,236	16	21	32	31	10,470	10	19	35	36	2,677	220	39	27	10
Dallas-Houston	79,137	18	21	31	30	19,848	12	19	35	34	6,110	473	35	20	7
MOUNTAIN AND PACIFIC															
Denver	32,341	15	22	33	30	8,829	10	19	35	36	1,742	238	23	18	12
Seattle-Portland	27,619	15	22	33	31	6,936	11	19	36	34	1,388	155	20	17	6
San Francisco	44,650	16	21	33	29	11,817	11	19	37	33	2,504	292	18	16	9
Los Angeles	155,311	17	22	34	28	41,571	11	19	37	33	10,416	990	28	21	7

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major Type and Age, 1983

Type of Machine Tool	Plants With	Total Units	Change Since '78	Percent of Total	0–4 Years	5–9 Years	10–19 Years	20 Years and Over
GRAND TOTAL	—	2,192,754	−8%	100.0%	13%	20%	34%	33%
Non-NC Grinding Machines	75%	383,027	0%	17.5%	14%	22%	34%	31%
Non-NC Turning Machines	77	332,327	−14	15.2	10	16	35	40
Non-NC Drilling Machines	74	281,453	−18	12.8	10	18	36	36
Non-NC Milling Machines	74	218,479	−5	10.0	12	20	36	32
Mechanical Presses	43	198,973	−15	9.1	6	14	36	45
Cutoff & Sawing Machines	86	169,107	5	7.7	17	28	33	22
Non-NC Bending & Forming	41	77,285	2	3.5	11	19	38	32
Non-NC Punching & Shearing	41	66,363	9	3.0	11	20	37	32
Hydraulic Presses	38	53,292	−5	2.4	14	22	34	30
Honing, Lapping, Polishing	33	50,626	NA	2.3	12	23	35	30
Non-NC Boring Machines	28	40,462	−17	1.8	8	11	34	47
Gear-cutting & -finishing	10	34,834	−11	1.6	7	11	32	50
NC Turning Machines	26	33,352	236	1.5	58	28	11	3
Tapping Machines	24	28,139	1	1.3	13	25	36	26
Machining Centers	19	24,003	26	1.1	58	26	15	1
Forging Machines	6	19,613	−4	0.9	6	11	30	54
Pneumatic Presses	8	17,656	NA	0.8	18	30	37	16
Broaching Machines	18	16,505	20	0.8	11	15	29	45
NC Milling Machines	16	15,929	209	0.7	44	27	22	6
Station-Type Machines	5	13,588	−25	0.6	16	20	32	31
Electrical-Machining Units	14	12,434	9	0.6	31	28	35	6
Other Non-NC Metal Cutting	4	12,075	NA	0.6	12	18	37	34
Threading Machines	13	11,703	−5	0.5	8	17	37	38
Other Non-NC Metalforming	3	11,255	−67	0.5	6	18	36	40
Coil-Processing Systems	6	10,852	−78	0.5	13	25	35	27
Thread-Rolling Machines	5	8,604	36	0.4	9	17	31	43
Diecasting Machines	2	8,095	−21	0.4	12	24	44	20
NC Drilling Machines	9	7,993	134	0.4	21	29	43	8
Multiple-Side Forming Mach.	2	7,003	−45	0.3	7	21	35	38
NC Punching & Shearing	8	6,223	277	0.3	37	29	26	8
Non-NC Thermal Cutting	8	5,302	−61	0.2	28	33	26	14
NC Boring Machines	7	5,064	68	0.2	29	22	33	17
Other NC Metalcutting	2	3,121	652	0.1	19	25	13	43
NC Bending & Forming	3	2,585	21	0.1	33	26	27	15
NC Grinding Machines	3	2,276	734	0.1	50	21	22	7
Sheet-, Plate-processing	2	1,634	NA	0.1	15	25	24	37
NC Thermal Cutting	3	1,034	NA	0.1	53	29	8	9
Other NC Metalforming	(a)	488	75	(b)	47	18	22	14

NA - Not Available.

(a) Percentage is less than 1%.
(b) Percentage is less than 0.1%.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

Number by Type of Machine and User Industry, 1983

Using Industry	Metal Cutting Total	Turn	Bore	Drill	Mill	Machining Centers	Metal Forming Total
TOTAL	94,012	33,352	5,064	7,993	15,929	24,003	9,296
Metal Furniture and Fixtures	253	46	19	58	43	23	357
Primary Metals Industries	2,413	842	271	261	433	353	249
Fabricated Metal Products	10,841	4,348	500	1,121	1,676	1,652	3,622
Ordnance and Accessories	797	NA	NA	NA	NA	NA	16
Non-Electrical Machinery	50,698	18,592	2,935	4,205	7,876	13,917	1,843
Metalworking Machinery	11,713	2,716	858	1,136	2,410	3,005	85
Machine Tools	3,373	956	355	400	355	1,103	31
Special Industry Machinery	3,903	1,115	219	559	563	1,314	134
Electrical Machinery and Equipment	9,415	2,677	182	1,150	1,983	2,644	1,357
Transportation Equipment	14,397	4,922	907	718	2,145	4,127	887
Aircraft Engines and Parts	8,450	2,790	426	336	1,692	2,810	332
Precision Instruments	4,434	1,538	110	227	1,132	1,240	440
Miscellaneous Manufacturing Industries	1,561	387	140	253	641	47	541

NA - Not Available.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

SEPTEMBER 7–15, 1988 CHICAGO, IL U.S.A.

IMTS

The world of manufacturing technology

1988 INTERNATIONAL MACHINE TOOL SHOW

The International Machine Tool Show is an international exchange of ideas for greater productivity and efficiency. Held in Chicago during September of every even numbered year, IMTS features every type of equipment and accessory, from sophisticated computer and numerical controlled systems to standard shop equipment.

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Sponsored by: nm tba national machine tool builders' association

Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System

BEA — Bureau of Economic Analysis

BLS — Bureau of Labor Statistics

BTN — Brussels Tariff Nomenclature

CCC — Customs Co-Operation Council

CECIMO — Comité Européen de Coopération des Industries de la Machine Outil

C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.

D — Withheld to avoid disclosing figures for individual companies

E — Estimate

EEC — European Economic Community

F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.

F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.

FTC — Federal Trade Commission

GNP — Gross National Product

ILO — International Labor Organization

ITC — International Trade Commission

NA — Not Available

NC — Numerically Controlled

NEC — Not Elsewhere Classified

NMTBA — National Machine Tool Builders' Association

P — Preliminary

R — Revised

S — Estimate did not meet Publication Standards

SEC — Securities and Exchange Commission

S.I.C. — Standard Industrial Classification

SITC — Standard International Trade Classification of the United Nations

TSUSA — Tariff Schedules of the U.S., Annotated

U.N. — United Nations

VDMA — Verein Deutscher Maschinenbauanstalten

VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA

Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS
........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS
........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET
........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS
........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS
........See EARNINGS

AVERAGE WEEKLY HOURS
........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS
........See EARNINGS

BACKLOG
........See ORDERS, UNFILLED

CANCELLATIONS
........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION
........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES
........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES
........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION
........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY
........Supplementary compensation statistics fall into two broad categories and are intended to capture

payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 24, 25, and 32 through 38. All other manufacturing major industry groups in SIC Codes 20 through 38 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

..........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

..........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics, Non-production bonuses are excluded.

..........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies, according to the Standard Industrial Classification, comprises SIC Industry Groups:

..........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

..........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other changes to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, Italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products.

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)
........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.
........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE
........See EXPORTS; IMPORTS

FRINGE BENEFITS
........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY
........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT
........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS
........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT
........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS
........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID
........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY
........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME
........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY
........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR
........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS

See EXPORTS

MANUFACTURERS' NEW ORDERS

See ORDERS

MANUFACTURERS' SHIPMENTS

See SHIPMENTS

MARKET CATEGORY

Major User Categories are classified either by Industry Group or by Market Category.

See MAJOR USERS, DEFENSE, and MACHINERY AND EOUIPMENT INDUSTRIES

MARKET SHARE:

Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF

"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

Cost of materials includes:

the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
the amount paid for electric energy purchased;
the amount paid for all fuels consumed for heat, power, or the generation of electricity;
the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
the cost of products bought and resold in the same condition.
cost of materials excludes the cost of services used, such as,
advertising, insurance, telephone, etc.;
research development, and consulting services;
overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
expense items chargeable to fixed asset accounts.

METAL FORMING

See MACHINE TOOLS

METAL CUTTING

See MACHINE TOOLS

METALWORKING INDUSTRY

Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,

3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devices
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY

Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.

3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC

See NUMERICAL CONTROLS

NET ASSETS
........See ASSETS, NET

NET INCOME
........See INCOME

NET NEW ORDERS
........See ORDERS

NET OPERATING PROFIT
........See INCOME

NET PROFIT ON SALES
........See INCOME

NET SALES
........See SALES

NEW HIRES
........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY
........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,
........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS
........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT
........See INCOME, NET OPERATING

ORDERS
........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS
........NEW ORDERS, NET,
....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS
....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS
........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS
....The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th Inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index. The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry--SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,
2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;
2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.

........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

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DEPARTMENT OF BUSINESS REGULATION

EIGHTIETH ANNUAL REPORT

OF THE

DIVISION OF BANKING AND SECURITIES

To the General Assembly

1987

SHOWING THE CONDITION OF
STATE BANKS, SAVINGS BANKS, TRUST COMPANIES
LOAN AND INVESTMENT COMPANIES,
BUILDING-LOAN ASSOCIATIONS and CREDIT UNIONS
AS OF DECEMBER 31, 1986

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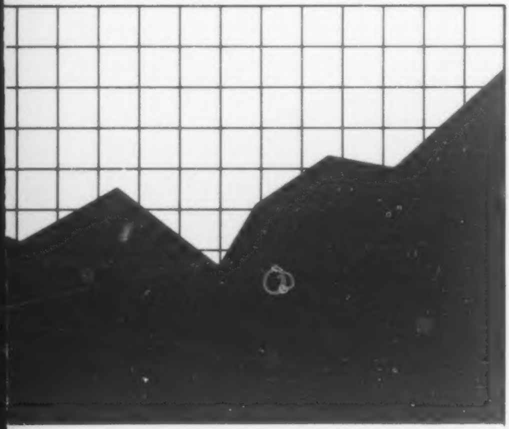
1988-89

The Economic Handbook of The Machine Tool Industry



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1988-1989
Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

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Rain of new orders relieves machine tool drought

All through the summer of '88 the news was dominated by stories of the nation's worst drought in 50 years, and its effect on the American farmer and the American consumer. Baking fields and drying rivers are dramatic, immediately understandable, and highly newsworthy.

Without at all meaning to detract from the seriousness of the situation, it must be said that a different drought has the potential to become a far greater threat to the economy and security of the United States if it continues.

The American machine tool industry has suffered for seven years—its worst and longest drought in fifty years. It is a truism that our industry is a cyclical one, for reasons we all understand. And in previous decades one-, two-, even three-year downturns were followed by sharp upturns. But the cycle flattened out beginning at the end of 1981.

Against this ominous background it is very gratifying to report that a new upward cycle seems to be underway. Starting in the last quarter of 1987 and continuing strongly in the first half of 1988, new orders for machine tools have soared. In the first half of 1988 orders are 83.8% above those in the first half of 1987. That's a remarkable surge and even more welcome for being so overdue. Moreover, there is every indication that the trend will continue.

It is even possible that 1988 will beat 1981, and we can dare to entertain realistic hopes that we are headed back to the levels of the late '70s.

What is driving this recovery? Obvious factors are the dramatic drop in the value of the dollar vs the yen and the mark, the institution of voluntary restraint agreements (VRAs) with Japan and Taiwan, federal support for machine tool research and for industry-initiated export promotion programs, and recognition of the importance of our industry to national defense. NMTBA can't claim credit for the more favorable exchange rate, but we have been instrumental in bringing about the other factors listed above.

A vital ingredient in the turnaround has been the vigorous response to market forces by American companies: they cut costs and delivery times; they improved quality and service. This self-help enabled companies that had suffered years of negative profits to get back on their feet.

Less obvious and quantifiable are several forces that combine at an opportune moment: the prospect for increased demand for manufactured goods worldwide; new technology which manufacturers must install if they are to be competitive; less emphasis among American Companies on quarterly profits and more on long-term objectives.

In other words, if there is to be more and better manufacturing, it must be preceded by investment in new and better machine tools and allied technology. Finally, it's our turn.

The strength of a nation lies in its manufacturing base, not in its service sector. And manufacturing in a competitive global economy relies wholly on the productive technology our American industry is ready and eager to supply.

James A. Gray
President

September 1988

Technical Note:

The 20th edition of the Economic Handbook offers executives, market researchers, legislators, administrators and students a comprehensive collection of data on the economy and the machine tool industry.

Wide fluctuations in currency values and varied definitions for different time periods account for occasional differences in the data for what appear to be identical subjects in the Handbook. As much as possible, these differences are explained in the chapter introductions, footnotes, and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

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1

NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist were it not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 240 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metal cutting machine tools shipments made up only slightly more than 10 cents of every $100 in goods and services produced. In 1987, shipments of complete machine tools made up just over 5 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. Business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included is a capacity utilization series for selected machine tool consuming industries as published by Data Resources, Inc.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly since the 1950s. Investment apparently has not kept up with the need to replace aging capital assets in U.S. metalworking industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes are limited in their ability to make adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

U.S. machine tool builders have traditionally been active exporters of their products. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. However, a surge in imports in the late 1970's, sparked by unprecedented peacetime machine tool demand, led to the development of a sizable balance of trade deficit. What is troubling is that the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the 1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS

1959 to Date

		Shipments in Billion Dollars			Shipments in Million Dollars		
Year	GNP Billion $	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry	Macine Tool Products	Complete Machine Tools
1959	$ 495.8	$ 363.4	$ 187.3	$ 26.6	$1,112	$ 975	$ 616
1960	515.3	370.5	190.6	26.8	1,266	1,126	744
1961	533.8	371.1	187.4	26.6	1,242	1,102	751
1962	574.6	400.3	207.1	29.2	1,430	1,223	821
1963	606.9	420.7	219.4	31.0	1,502	1,370	896
1964	649.8	448.0	235.6	35.3	1,791	1,650	1,164
1965	705.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	772.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	816.4	557.8	303.2	49.2	2,841	2,585	1,806
1968	892.7	603.2	332.4	51.0	2,817	2,500	1,727
1969	963.9	642.5	353.7	56.1	2,835	2,507	1,598
1970	1,015.5	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,102.7	671.1	359.7	56.0	2,019	1,698	998
1972	1,212.8	756.3	408.3	65.8	2,112	1,929	1,019
1973	1,359.3	875.2	476.2	77.8	2,777	2,596	1,501
1974	1,472.8	1,017.5	530.7	92.5	3,580	3,189	2,031
1975	1,598.4	1,039.1	523.9	95.8	3,834	3,432	2,452
1976	1,782.8	1,185.6	608.3	105.5	3,567	3,197	2,060
1977	1,990.5	1,358.4	711.2	122.2	3,943	3,675	2,281
1978	2,249.7	1,522.9	814.2	143.2	4,978	4,735	3,013
1979	2,508.2	1,727.2	912.7	166.5	6,053	5,762	3,877
1980	2,732.0	1,852.7	930.6	180.7	6,981	6,702	4,692
1981	3,052.6	2,017.5	1,006.5	201.5	7,481	7,206	5,096
1982	3,166.0	1,960.2	952.2	187.9	5,840	5,539	3,604
1983(r)	3,405.7	2,054.9	1,019.5	179.0	4,023	3,664	1,845
1984(r)	3,772.2	2,254.4	1,159.5	210.4	4,520	4,178	2,286
1985(r)	4,010.3	2,279.1	1,187.2	215.1	4,790	4,353	2,545
1986(r)	4,235.0	2,273.3	1,201.7	205.8	4,964	4,369	2,579
1987(p)	4,488.5	2,408.6	1,263.9	212.6	NA	NA	2,324

NA - Not Available. p - Preliminary. r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1979" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S, Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1982-1986" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufacturers," M (AS)-1 & 2 and 1982 "Census of Manufacturers". Col. 7: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments originating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, with values greater than $2,500 per unit including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS

Indexes, 1959 to Date

1982 = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1959	15.7	18.5	19.7	14.2	19.0	17.6	17.1
1960	16.3	18.9	20.0	14.3	21.7	20.3	20.6
1961	16.9	18.9	19.7	14.2	21.3	19.9	20.8
1962	18.1	20.4	21.7	15.5	24.5	22.1	22.8
1963	19.2	21.5	23.0	16.5	25.7	24.7	24.9
1964	20.5	22.9	24.7	18.8	30.7	29.8	32.3
1965	22.3	25.1	28.0	21.0	36.1	35.3	39.6
1966	24.4	27.5	31.1	25.0	43.7	41.9	46.8
1967	25.8	28.5	31.8	26.2	48.6	46.7	50.1
1968	28.2	30.8	34.9	27.1	48.2	45.1	47.9
1969	30.4	32.8	37.1	29.9	48.5	45.3	44.3
1970	32.1	32.3	35.6	30.1	44.5	41.1	40.0
1971	34.8	34.2	37.8	29.8	34.6	30.7	27.7
1972	38.3	38.6	42.9	35.0	36.2	34.8	28.3
1973	42.9	44.6	50.0	41.4	47.6	46.9	41.6
1974	46.5	51.9	55.7	49.2	61.3	57.6	56.4
1975	50.5	53.0	55.0	51.0	65.7	62.0	68.0
1976	56.3	60.5	63.9	56.1	61.1	57.7	57.2
1977	62.9	69.3	74.7	65.0	67.5	66.3	63.3
1978	71.1	77.7	85.5	76.2	85.2	85.5	83.6
1979	79.2	88.1	95.9	88.6	103.6	104.0	107.6
1980	86.3	94.5	97.7	96.2	119.5	121.0	130.2
1981	96.4	102.9	105.7	107.2	128.1	130.1	141.4
1982	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1983(r)	107.5	104.8	107.1	95.3	68.9	66.1	51.2
1984(r)	119.1	115.0	121.8	112.0	77.4	75.4	63.4
1985(r)	126.6	116.3	124.7	114.5	82.0	78.6	70.6
1986(r)	133.8	116.0	126.2	109.5	85.0	78.9	71.6
1987(p)	141.8	122.9	132.7	113.1	NA	NA	64.5

NA - Not Available. p - Preliminary. r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1965 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1965	$ 705.1	$ 440.7	$116.2	$ 9.7	$138.6
1966	772.0	477.3	128.6	7.5	158.6
1967	816.4	503.6	125.7	7.4	179.7
1968	892.7	552.5	137.0	5.5	197.7
1969	963.9	597.9	153.2	5.6	207.3
1970	1,015.5	640.0	148.8	8.5	218.2
1971	1,102.7	691.6	172.5	6.3	232.4
1972	1,212.8	757.6	202.0	3.2	250.0
1973	1,359.3	837.2	238.8	16.8	266.5
1974	1,472.8	916.5	240.8	16.3	299.1
1975	1,598.4	1,012.8	219.6	31.1	335.0
1976	1,782.8	1,129.3	277.7	18.8	356.9
1977	1,990.5	1,257.2	344.1	1.9	387.3
1978	2,249.7	1,403.5	416.8	4.1	425.2
1979	2,508.2	1,566.8	454.8	18.8	467.8
1980	2,732.0	1,732.6	437.0	32.1	530.3
1981	3,052.6	1,915.1	515.5	33.9	588.1
1982	3,166.0	2,050.7	447.3	26.3	641.7
1983(r)	3,405.7	2,234.5	502.3	−6.1	675.0
1984(r)	3,772.2	2,430.5	664.8	−58.9	735.9
1985(r)	4,010.3	2,629.4	641.6	−79.2	818.6
1986(r)	4,235.0	2,799.8	671.0	−105.5	869.7
1987(p)	4,488.5	2,967.8	717.5	−119.6	922.8
In constant 1982 dollars (billions)					
1965	$2,087.6	$1,236.4	$367.0	$ −2.7	$487.0
1966	2,208.3	1,298.9	390.5	−13.7	532.6
1967	2,271.4	1,337.7	374.4	−16.9	576.2
1968	2,365.6	1,405.9	391.8	−29.7	597.6
1969	2,423.3	1,456.7	410.3	−34.9	591.2
1970	2,416.2	1,492.0	381.5	−30.0	572.6
1971	2,484.8	1,538.8	419.3	−39.8	566.5
1972	2,608.5	1,621.9	465.4	−49.4	570.7
1973	2,744.1	1,689.6	520.8	31.5	565.3
1974	2,729.3	1,674.0	481.3	0.8	573.2
1975(r)	2,695.0	1,711.9	383.3	18.9	580.9
1976	2,826.7	1,803.9	453.5	−11.0	580.3
1977	2,958.6	1,883.8	521.3	−35.5	589.1
1978	3,115.2	1,961.0	576.9	−26.8	604.1
1979	3,192.4	2,004.4	575.2	3.6	609.1
1980	3,187.1	2,000.4	509.3	57.0	620.5
1981	3,248.8	2,024.2	545.5	49.4	629.7
1982	3,166.0	2,050.7	447.3	26.3	641.7
1983(r)	3,279.1	2,146.0	504.0	−19.9	649.0
1984(r)	3,501.4	2,249.3	658.4	−84.0	677.7
1985(r)	3,607.5	2,352.6	636.1	−108.2	726.9
1986(r)	3,713.3	2,450.5	654.0	−145.8	754.5
1987(p)	3,821.0	2,497.2	687.6	−135.5	771.7

p - Preliminary. r - Revised.

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

	Measure	Actual			Projection
		1985(r)	1986(r)	1987(p)	1988
Gross National Product	Bil. $	4,010.3	4,235.0	4,488.5	4,737.0
GNP in Constant Dollars	Bil. 1982 $	3,607.5	3,713.3	3,821.0	3,897.0
GNP Implicit Price Deflator	1982 = 100	111.2	114.0	117.5	121.4
Industrial Production	1977 = 100	123.8	125.1	129.8	134.0
Unemployment Rate	Percent%	7.2%	7.0%	6.2%	6.2%
Corporate Profits After Taxes	Bil. $	180.9	179.4	167.8	158.0
Non-Residential Fixed Investment	Bil. 1982 $	454.1	443.8	448.3	472.0
Change in Business Inventories	Bil. 1982 $	5.2	13.8	42.9	14.3
Personal Consumption Expenditures	Bil. 1982 $	2,352.6	2,450.5	2,497.2	2,542.5
Federal Government Purchases	Bil. 1982 $	324.2	332.5	336.0	340.0

p - Preliminary. r - Revised.

Sources: Actual: U.S. Department of Commerce, "Survey of Current Business" (monthly); "Economic Report of the President," February 1988 and earlier editions. Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters, "Economic Outlook USA, Spring 1987."

SELECTED PRICE DEFLATORS
1967 to Date

Year	Price Deflators			
	Gross National Product	Personal Consumption Expenditure	Producers Durable Equipment	Metalworking Machinery & Equipment
	1982 = 100			
1967	35.9	37.6	38.4	31.2
1968	37.7	39.3	39.9	32.4
1969	39.8	41.0	41.5	33.6
1970	42.0	42.9	43.2	35.6
1971	44.4	44.9	45.5	36.6
1972	46.5	46.7	46.8	37.5
1973	49.5	49.6	47.3	39.1
1974	54.0	54.8	51.1	45.8
1975	59.3	59.2	59.7	53.5
1976	63.1	62.6	64.4	56.9
1977	67.3	66.7	68.3	61.9
1978	72.2	71.6	73.3	67.6
1979	78.6	78.2	78.6	75.2
1980	85.7	86.6	86.0	85.5
1981	94.0	94.6	93.7	93.9
1982	100.0	100.0	100.0	100.0
1983(r)	103.9	104.1	99.5	101.7
1984(r)	107.7	108.1	97.7	104.1
1985(r)	111.2	111.8	95.2	106.5
1986(r)	114.1	114.3	95.5	108.4
1987(p)	117.5	118.8	95.5	110.1

p - Preliminary. r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators;" Metalworking Machinery and Equipment values are "Producer Price Indices."

Source: U.S. Department of Commerce, "Business Statistics," 1979; "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1945 to Date
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1945	$ 213.4	$ 53.4	25.0%	$ 42.7	20.0%	$ 11.6	5.4%
1950	288.3	69.4	24.1	50.4	17.5	21.3	7.4
1955	405.9	101.6	25.0	73.1	18.0	31.7	7.8
1960	515.3	140.4	27.2	96.9	18.8	50.0	9.7
1965	705.1	190.2	27.0	125.8	17.8	75.5	10.7
1970	1,015.5	306.8	30.2	195.4	19.2	135.8	13.4
1975	1,598.4	480.0	30.0	294.9	18.4	239.6	15.0
1976	1,782.8	549.1	30.8	340.1	19.1	270.1	15.2
1977	1,990.5	616.6	31.0	384.1	19.3	300.1	15.1
1978	2,249.7	694.4	30.9	441.4	19.6	330.3	14.7
1979	2,508.2	779.8	31.1	505.0	20.1	355.3	14.2
1980	2,732.0	855.1	31.3	553.8	20.3	390.0	14.3
1981	3,052.6	977.2	32.0	639.5	20.9	425.6	13.9
1982	3,166.0	1,000.8	31.6	635.3	20.1	449.4	14.2
1983(r)	3,405.7	1,061.3	31.2	659.9	19.4	487.7	14.3
1984(r)	3,772.2	1,172.9	31.1	726.0	19.2	540.5	14.3
1985(r)	4,010.3	1,268.5	31.6	788.6	19.7	579.6	14.5
1986(r)	4,235.0	1,339.3	31.6	827.4	19.5	618.8	14.6
1987(p)	4,488.5	1,463.4	32.6	915.7	20.4	651.1	14.5

p - Preliminary. r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," February 1988. U.S. Department of Commerce, "Survey of Current Business" (monthly).

CORPORATE PROFITS AND TAX
Selected Years, 1945 to Date (r)
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1945	19.8	10.7	9.1	4.6	4.5
1950	42.9	17.9	25.0	8.8	16.2
1955	49.2	22.0	27.2	10.3	16.9
1960	49.9	22.7	27.2	12.9	14.3
1965	77.4	30.9	46.5	19.1	27.4
1970	76.0	34.4	41.7	22.5	19.2
1975	134.8	50.9	83.9	29.6	54.3
1976	166.3	63.8	102.5	37.4	65.1
1977	194.7	72.7	122.0	40.8	81.2
1978	229.1	82.2	145.9	47.0	98.9
1979	252.7	87.6	165.1	52.7	112.4
1980	234.6	84.8	149.8	58.6	91.2
1981	221.2	81.1	140.0	66.5	73.5
1982	169.5	63.1	106.5	66.9	39.6
1983	207.6	77.2	130.4	71.5	58.9
1984	240.0	93.9	146.1	79.0	67.0
1985	224.8	96.7	128.1	81.3	46.8
1986	231.9	105.0	126.8	86.8	40.0
1987(p)	274.1	136.3	137.8	93.8	43.9

p - Preliminary. r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1931 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (–)	Year	Receipts	Outlay	Surplus or Deficit (–)
1931	$ 3.1	$ 3.6	$ –0.5	1961	$ 94.4	$ 97.7	$ –3.3
1932	1.9	4.7	–2.7	1962	99.7	106.8	–7.1
1933	2.0	4.6	–2.6	1963	106.6	111.3	–4.8
1934	3.0	6.6	–3.6	1964	112.6	118.5	–5.9
1935	3.7	6.5	–2.8	1965	116.8	118.2	–1.4
1936	4.0	8.4	–4.4	1966	130.8	134.5	–3.7
1937	5.0	7.7	–2.8	1967	148.8	157.5	–8.6
1938	5.6	6.8	–1.2	1968	153.0	178.1	–25.2
1939	6.3	9.1	–2.8	1969	186.9	183.6	3.2
1940	6.5	9.5	–2.9	1970	192.8	195.6	–2.8
1941	8.7	13.7	–4.9	1971	187.1	210.2	–23.0
1942	14.6	35.1	–20.5	1972	207.3	230.7	–23.4
1943	24.0	78.6	–54.6	1973	230.8	245.7	–14.9
1944	43.7	91.3	–47.6	1974	263.2	269.4	–6.1
1945	45.2	92.7	–47.6	1975	279.1	332.3	–53.2
1946	39.3	55.2	–15.9	1976	298.1	371.8	–73.7
1947	38.5	34.5	4.0	Tr. Qtr.	81.2	96.0	–14.7
1948	41.6	29.8	11.8	1977	355.6	409.2	–53.6
1949	39.4	38.8	0.6	1978	399.6	458.7	–59.2
1950	39.4	42.6	–3.1	1979	463.3	503.5	–40.2
1951	51.6	45.5	6.1	1980	517.1	590.9	–73.8
1952	66.2	67.7	–1.5	1981	599.3	678.2	–78.9
1953	69.6	76.1	–6.5	1982	617.8	745.7	–127.9
1954	69.7	70.9	–1.2	1983	600.6	808.3	–207.8
1955	65.5	68.4	–3.0	1984	666.5	851.8	–185.3
1956	74.6	70.6	3.9	1985	734.1	946.3	–212.3
1957	80.0	76.6	3.4	1986(r)	769.1	990.3	–221.2
1958	79.6	82.4	–2.8	1987(r)	854.1	1,004.6	–150.4
1959	79.2	92.1	–12.8	1988E	909.2	1,055.9	–146.7
1960	92.5	92.2	0.3	1989E	964.7	1,094.2	–129.5

E - Estimate. r - Revised.

Tr. Qtr.-Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: "Economic Report of the President," February 1988 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT

1960 to Date

(Values in Billions of Current Dollars)

Year	Gross National Product	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
	Billion $	Billion $	% of GNP	Billion $	% of GNP
1960	$ 515.3	$ 48.8	9.5%	$ 29.7	5.8%
1961	533.8	48.3	9.0	28.9	5.4
1962	574.6	52.5	9.1	32.1	5.6
1963	606.9	55.2	9.1	34.4	5.7
1964	649.8	61.4	9.4	38.7	6.0
1965	705.1	73.1	10.4	45.8	6.5
1966	772.0	83.5	10.8	53.0	6.9
1967	816.4	84.4	10.3	53.7	6.6
1968	892.7	91.4	10.2	58.5	6.6
1969	963.9	102.3	10.6	65.2	6.8
1970	1,015.5	105.2	10.4	66.1	6.5
1971	1,102.7	109.6	9.9	68.7	6.2
1972	1,212.8	123.0	10.1	78.5	6.5
1973	1,359.3	145.9	10.7	94.5	7.0
1974	1,472.8	160.6	10.9	103.6	7.0
1975	1,598.4	162.9	10.2	106.6	6.7
1976	1,782.8	180.0	10.1	119.9	6.7
1977	1,990.5	214.2	10.8	147.4	7.4
1978	2,249.7	259.0	11.5	178.0	7.9
1979	2,508.2	302.8	12.1	203.3	8.1
1980	2,732.0	322.8	11.8	208.9	7.6
1981	3,052.6	369.2	12.1	230.7	7.6
1982	3,166.0	366.7	11.6	223.4	7.1
1983(r)	3,405.7	356.9	10.5	232.8	6.8
1984(r)	3,772.2	416.0	11.0	274.9	7.3
1985(r)	4,010.3	442.6	11.0	290.1	7.2
1986(r)	4,235.0	436.9	10.3	299.5	7.1
1987(p)	4,488.5	443.4	9.9	309.2	6.9

p - Preliminary. r - Revised.

Sources: "Economic Report of the President," February 1988; U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchases of automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT

1960 to Date

(Values in Billions of 1982 Dollars)

Year	Gross National Product	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
	Billion $	Billion $	% of GNP	Billion $	% of GNP
1960	1,665.3	159.4	9.6	83.3	5.0
1961	1,708.7	158.2	9.3	80.5	4.7
1962	1,799.4	170.2	9.5	88.9	4.9
1963	1,873.3	176.6	9.4	95.1	5.1
1964	1,973.3	194.9	9.9	107.0	5.4
1965	2,087.6	227.6	10.9	125.8	6.0
1966	2,208.3	250.4	11.3	142.4	6.4
1967	2,271.4	245.0	10.8	139.6	6.1
1968	2,365.6	254.5	10.8	146.5	6.2
1969	2,423.3	269.7	11.1	156.8	6.5
1970	2,416.2	264.0	10.9	152.9	6.3
1971	2,484.8	258.4	10.4	151.0	6.1
1972	2,608.5	277.0	10.6	167.5	6.4
1973	2,744.1	317.3	11.6	199.6	7.3
1974	2,729.3	317.8	11.6	202.7	7.4
1975	2,695.9	281.2	10.4	178.4	6.6
1976	2,826.7	290.6	10.3	186.2	6.6
1977	2,958.6	324.0	11.0	215.7	7.3
1978	3,115.2	362.1	11.6	242.8	7.8
1979	3,192.4	389.4	12.2	258.8	8.1
1980	3,187.1	379.2	11.9	243.0	7.6
1981	3,248.8	395.2	12.2	246.4	7.6
1982	3,166.0	366.7	11.6	223.4	7.1
1983(r)	3,279.1	361.2	11.0	233.9	7.1
1984(r)	3,501.4	425.2	12.1	281.4	8.0
1985(r)	3,607.5	454.1	12.6	304.8	8.4
1986(r)	3,713.3	443.8	12.0	313.5	8.4
1987(p)	3,821.0	448.3	11.7	323.9	8.5

p - Preliminary. r - Revised.

Sources: "Economic Report of the President," February 1988; U.S. Department of Commerce, "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
1967 to Date

	All Merchandise (r) Billions of Dollars			Machine Tools and Parts Millions of Dollars		
Year	Exports	Imports	Net Balance	Exports	Imports	Net Balance
1967	$ 30.7	$ 26.9	$ −3.8	$ 294.5	$ 203.7	$ −90.8
1968	33.6	33.0	.6	286.0	191.3	94.7
1969	36.4	35.8	.6	323.5	182.5	140.9
1970	42.5	39.9	2.6	403.9	158.5	245.4
1971	43.3	45.6	−2.3	351.0	109.6	241.4
1972	49.4	55.8	−6.4	332.1	141.8	190.3
1973	71.4	70.5	0.9	443.0	211.6	231.4
1974	98.3	103.8	−5.5	566.5	330.3	236.2
1975	107.1	98.2	8.9	705.9	382.4	323.5
1976	114.7	124.2	−9.5	682.8	383.3	299.5
1977	120.8	151.9	−31.1	579.6	482.2	97.4
1978	142.1	176.0	−33.9	738.6	832.4	−93.7
1979	184.5	212.0	−27.5	878.6	1,269.5	−390.9
1980	224.3	249.8	−25.5	1,099.2	1,556.9	−457.7
1981	237.1	265.1	−28.0	1,445.6	1,712.9	−267.3
1982	211.2	247.6	−36.4	1,002.4	1,489.4	−487.0
1983	201.8	268.9	−67.1	691.9	1,100.2	−408.3
1984	219.9	332.4	−112.5	734.9	1,652.7	−917.8
1985	215.9	338.1	−122.2	772.2	2,110.2	−1,338.0
1986	224.4	368.7	−144.3	908.1	2,682.9	−1,774.8
1987(p)	257.6	411.3	−153.7	1,010.2	2,412.3	−1,402.1

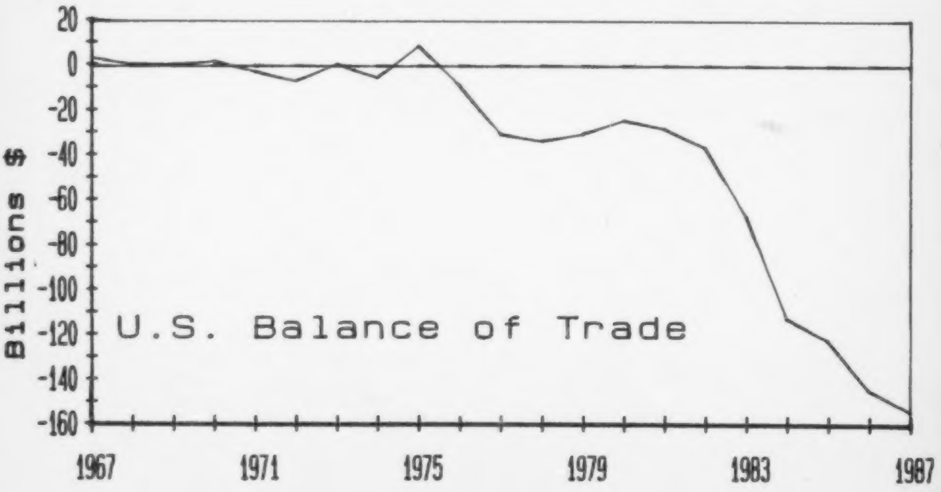
p - Preliminary. r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source: All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly): "Economic Report of the President," February 1988; Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146."

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS

Book Value at Year End, 1982 to 1987

(Millions of U.S. Dollars)

	1982	1983	1984(r)	1985	1986	1987
World:						
Total All Industries	$207,752	$207,203	$211,480	$229,748	$259,890	$308,793
Manufacturing	83,452	82,907	85,865	95,104	107,241	126,640
Canada:						
Total All Industries	43,511	44,339	46,730	47,106	50,178	56,879
Manufacturing	18,825	19,209	20,986	21,848	23,759	25,800
European Economic Community(a,r):						
Total All Industries	71,712	70,210	69,500	81,337	99,619	122,247
Manufacturing	34,292	34,525	34,379	41,934	52,034	64,914
United Kingdom:						
Total All Industries	27,537	27,637	28,553	32,801	34,990	44,673
Manufacturing	10,704	10,920	10,512	12,777	13,990	18,268
Other Western Europe:						
Total All Industries	20,737	21,968	22,089	24,034	23,564	26,707
Manufacturing	3,528	3,413	3,254	3,761	2,092	2,562
Japan:						
Total All Industries	6,407	7,661	7,936	9,246	11,333	14,270
Manufacturing	3,058	3,915	4,076	4,593	5,305	7,073
Australia, New Zealand, & South Africa:						
Total All Industries	12,014	11,558	10,868	10,146	10,015	13,212
Manufacturing	4,434	4,284	4,256	3,770	3,972	4,411
Latin America:						
Total All Industries	28,161	24,133	24,627	27,901	34,970	42,337
Manufacturing	15,789	13,995	14,566	14,760	15,193	15,902
Other Areas:						
Total All Industries	25,211	27,334	29,730	29,977	30,210	28,837
Manufacturing	3,526	3,565	4,350	4,437	4,887	5,979

r - Revised.

(a) Beginning in 1986, Portugal and Spain are included in the European Economic Community.

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and capital movements between U.S. corporations and their foreign affiliates.

Source: U.S. Department of Commerce, "Survey of Current Business," (June).

ESTIMATES OF CAPITAL EXPENDITURES*
BY MAJORITY-OWNED FOREIGN AFFILIATES OF U.S. COMPANIES
BY SELECTED COUNTRY OR AREA, 1981–1988

(Millions of U.S. Dollars)

	Actual						Projection	
	1981	1982	1983	1984	1985	1986(r)	1987(r)	1988
WORLD								
Total Manufacturing	$19,164	$16,755	$13,724	$14,048	$14,923	$16,392	$16,806	$19,553
Mchy., Except Elec.	5,106	4,900	3,778	3,206	3,016	2,858	2,870	3,355
CANADA								
Total Manufacturing	3,800	2,740	2,590	2,702	2,926	3,322	3,039	3,341
Mchy., Except Elec.	649	601	413	295	223	218	232	313
LATIN AMERICA								
Total Manufacturing	3,114	2,703	1,744	1,909	2,026	2,027	2,124	2,491
Mchy., Except Elec.	422	369	227	319	356	270	268	264
EUROPE								
Total Manufacturing	10,273	9,274	7,824	7,619	7,900	8,897	9,470	11,122
Mchy., Except Elec.	3,423	3,249	2,844	2,247	1,837	1,939	1,912	2,107
UNITED KINGDOM								
Total Manufacturing	2,591	2,529	2,113	2,107	2,213	2,154	2,314	2,755
Mchy., Except Elec.	735	635	600	465	454	400	334	346
FRANCE								
Total Manufacturing	1,316	1,323	1,241	1,232	1,010	1,296	1,488	1,576
Mchy., Except Elec.	821	868	798	746	469	583	545	519
FEDERAL REP. OF GERMANY								
Total Manufacturing	2,653	2,306	2,180	2,163	2,371	2,738	2,569	3,323
Mchy., Except Elec.	959	894	723	577	450	521	552	676
ITALY								
Total Manufacturing	797	696	639	504	595	602	723	781
Mchy., Except Elec.	D	D	350	208	209	183	D	D
ASIA AND PACIFIC								
Total Manufacturing	1,237	1,327	1,004	1,265	1,358	1,277	1,284	1,726
Mchy., Except Elec.	47(a)	57(a)	58(a)	317	74(a)	61(a)	56(a)	63(a)
JAPAN								
Total Manufacturing	666	765	463	551	744	704	667	1,018
Mchy., Except Elec.	D	D	D	258	D	D	D	D
SOUTH AFRICA								
Total Manufacturing	147	211	174	137	90	45	55	52
Mchy., Except Elec.	19	18	14	12	10	D	D	D
AUSTRALIA								
Total Manufacturing	512	424	323	364	556	613	736	684
Mchy., Except Elec.	D	29	12	14	19	18	D	D

D - Withheld to avoid disclosure. r - Revised.

(a) Excludes Japan.

* – "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (March).

EXPENDITURES ON NEW PLANT AND EQUIPMENT

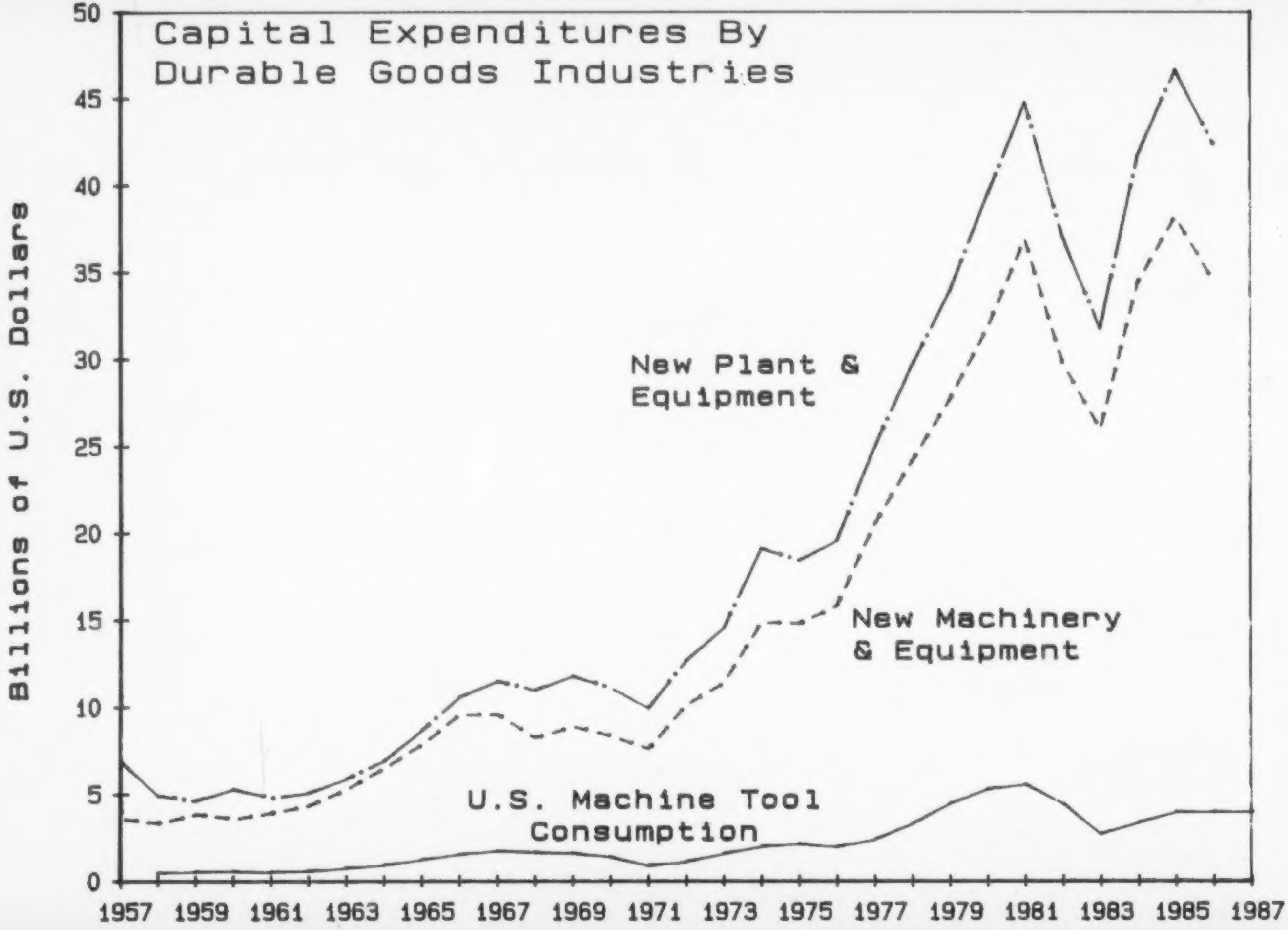
Major Industries, Selected Years, 1960 to Date

(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 39.44	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$ 1.47	$0.47
1965	59.52	25.41	13.49	1.69	2.24	3.00	0.74
1970	91.91	36.99	19.80	3.49	3.78	3.05	1.60
1971	92.91	33.60	16.78	3.03	3.15	2.42	1.12
1972	103.40	35.42	18.22	2.83	3.23	3.00	1.41
1973	120.03	42.35	22.63	3.48	3.95	3.83	1.77
1974	139.67	52.48	26.77	3.80	5.13	4.29	2.31
1975	142.42	53.66	25.37	3.08	4.86	3.33	2.13
1976	158.44	58.53	27.50	3.61	5.43	3.60	2.19
1977	184.82	67.48	32.77	4.61	6.35	5.82	2.50
1978	217.76	78.58	39.46	5.89	7.42	7.19	3.63
1979	254.96	95.92	48.50	7.55	10.17	8.34	4.71
1980	282.80	112.33	55.36	9.77	11.41	9.02	5.96
1981	315.22	126.54	59.81	10.58	13.68	9.83	5.60
1982	310.58	120.68	55.35	11.01	13.44	7.77	4.79
1983	304.78	116.20	53.08	11.42	13.50	7.29	4.04
1984	354.44	138.82	66.24	14.61	15.41	11.20	4.98
1985	387.13	153.48	73.27	15.47	15.98	14.63	4.83
1986(r)	379.47	142.69	69.14	14.17	13.61	13.95	4.93
1987(r)	388.60	145.46	70.91	15.26	13.77	12.02	4.72
1988E	422.96	159.68	75.75	17.06	14.49	11.45	4.88

E - Estimate. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (April).


Capital Expenditures By
Durable Goods Industries
Billions of U.S. Dollars
0
5
10
15
20
25
30
35
40
45
50
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
New Plant &
Equipment
New Machinery
& Equipment
U.S. Machine Tool
Consumption

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1954 to Date

Year	New Plant & Equipment Expenditures Billion Dollars BEA (a,r) Total	Census (b) Total	Census (b) Plant	Census (b) Equipment	U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of BEA (a,r) Total	Census (b) Total	Census (b) Equipment
1954	$ 4.91	$ 4.32	$1.20	$ 3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.95	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.94	1.33	3.61	$ 554.9	9.9%	11.2%	15.4%
1959	6.73	4.64	1.29	3.35	587.1	8.7	12.7	17.5
1960	8.28	5.34	1.47	3.87	634.0	7.7	11.9	16.4
1961	7.42	4.81	1.21	3.60	544.4	7.3	11.3	15.1
1962	7.81	5.12E	1.17E	3.95E	625.0	8.0	12.2	15.8
1963	8.64	5.92	1.55	4.37	798.3	9.2	13.5	18.3
1964	10.99	6.95	1.64	5.31	967.2	8.8	13.9	18.2
1965	13.49	8.70	2.18	6.52	1,263.5	9.4	14.5	19.4
1966	17.23	10.61E	2.72E	7.89E	1,588.9	9.2	15.0	20.1
1967	17.82	11.52	1.92	9.60	1,780.0	10.0	15.4	18.5
1968	17.93	10.97	2.71	8.26	1,669.8	9.3	15.2	20.2
1969	19.97	11.81	2.90	8.91	1,605.9	8.0	13.6	18.0
1970	19.80	11.11	2.74	8.37	1,391.5	7.0	12.5	16.6
1971	16.78	9.96	2.34	7.62	896.4	5.3	9.0	11.6
1972	18.22	12.70	2.56	10.14	1,145.1	6.3	9.0	11.3
1973	22.63	14.58	3.15	11.43	1,[illegible].4	7.2	11.2	14.3
1974	26.77	19.13	4.26	14.87	2,026.2	7.6	10.6	13.6
1975	25.37	18.42	3.60	14.82	2,187.0	8.6	11.9	14.8
1976	27.50	19.57	3.75	15.82	1,981.6	7.2	10.1	12.5
1977	32.77	24.93	4.41	20.52	2,427.6	7.4	9.7	11.8
1978	39.46	29.66	5.52	24.14	3,324.8	8.4	11.2	13.8
1979	48.50	33.91	6.22	27.69	4,488.7	9.3	13.2	16.2
1980	55.36	39.42	7.62	31.80	5,338.0	9.6	13.5	16.8
1981	59.81	44.75	7.83	36.91	5,593.2	9.3	12.5	15.2
1982	55.35	37.02	7.23	29.80	4,447.4	8.0	12.0	14.9
1983	53.08	31.78	5.80	25.98	2,706.9	5.1	8.5	10.4
1984	66.24	41.74	7.33	34.42	3,371.9	5.1	8.1	9.8
1985(r)	73.27	46.64	8.43	38.21	3,970.4	5.4	8.5	10.4
1986(r)	69.14	42.41	7.86	34.55	4,418.3	6.4	10.4	12.8
1987(p)	70.91	NA	NA	NA	3,967.1	5.6	NA	NA

NA - Not Available. E - Estimate. p - Preliminary. r - Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: U.S. Department of Commerce, "Survey of Current Business" (April); Bureau of the Census, "Annual Survey of Manufacturers, Expenditures for New Plant and New Equipment"; and NMTBA.

The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT

By Major Machine Tool Consuming Industries, 1949 to Date

(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1949	NA	$ 167.8	$ 214.5	$ 133.5	$ 147.9	$ 27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1974	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7
1981	36,912	3,791.8	7,040.1	5,098.1	7,539.0	1,325.4
1982	29,796	2,934.0	6,489.4	5,364.4	3,377.7	1,230.1
1983	25,977	2,316.3	5,447.0	5,826.6	1,991.2	1,107.1
1984	34,416	3,203.4	6,603.9	8,146.8	3,801.7	1,508.1
1985(r)	38,211	3,635.1	6,996.3	8,378.1	5,185.0	1,820.9
1986(p)	34,551	3,860.8	5,630.4	7,181.2	5,408.5	2,069.4

p - Preliminary. r - Revised. NA - Not Available. S - Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $840 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufacturers, Expenditures for New Plant and New Equipment."

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES

Selected Years, 1960 to Date

(Billions of Dollars)

	Purchases		Depreciation (a)		Net Investment (b)		Net Value (c)	
Year	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1960	$10.4	$ 7.5	$ 8.4	$ 6.7	$ 2.0	$ .8	$ 94.7	$ 63.3
1965	18.0	12.8	10.4	8.2	7.6	4.6	121.1	78.5
1970	23.8	17.4	16.5	12.7	7.3	4.7	203.8	126.8
1972	25.2	19.4	19.7	14.6	5.5	4.8	233.6	141.3
1973	27.9	21.3	20.7	15.4	7.2	5.9	255.3	153.9
1974	37.4	28.5	23.8	17.8	13.6	10.7	313.5	193.6
1975	38.5	30.5	28.7	22.0	9.8	8.5	351.3	226.3
1976	41.7	33.3	31.9	24.7	9.8	8.6	382.5	248.4
1977	48.0	39.2	35.6	27.6	12.4	11.6	424.9	278.7
1978	58.2	47.2	40.2	31.4	18.0	15.8	493.7	317.9
1979	67.3	52.8	46.6	36.3	20.7	16.5	550.8	363.8
1980	75.3	60.6	53.1	41.8	22.2	18.8	633.9	424.9
1981	81.9	65.4	61.0	48.3	20.9	17.1	713.4	418.7
1982	78.3	61.6	67.2	53.5	11.1	8.1	715.2	513.5
1983	68.4	55.9	70.0	55.5	−1.6	.4	768.0	517.4
1984	82.4	69.1	72.7	57.5	9.7	11.6	797.6	537.1
1985	88.8	73.4	75.7	60.0	13.1	13.4	823.0	558.7
1986	80.2	65.5	77.4	60.9	2.8	4.6	835.4	557.5
1987	82.2	68.6	80.0	62.7	2.2	5.9	859.2	573.5
In 1982 Dollars								
1960	$34.5	$23.6	$27.4	$20.9	$ 7.1	$ 2.7	$321.2	$202.2
1965	56.4	38.4	31.4	23.7	25.0	14.7	382.4	235.8
1970	59.9	42.7	40.8	30.6	19.1	12.1	513.3	314.3
1972	57.1	43.6	45.1	33.4	12.0	10.2	537.7	333.4
1973	61.6	47.7	45.8	34.6	5.8	13.1	554.2	347.2
1974	74.0	57.1	47.6	36.3	6.4	20.8	581.1	368.6
1975	65.1	51.3	49.8	38.1	5.3	13.2	597.2	382.5
1976	66.2	52.1	51.8	39.9	14.4	12.2	612.5	395.5
1977	71.4	57.8	54.1	41.8	17.3	16.0	630.5	412.3
1978	80.2	64.7	56.4	44.0	23.8	20.7	655.1	433.7
1979	85.1	66.7	59.7	46.6	25.4	20.1	681.4	454.8
1980	86.8	69.8	62.0	48.9	26.8	20.9	707.2	476.6
1981	86.2	68.8	64.8	51.4	21.4	17.4	729.7	495.0
1982	77.8	61.0	67.2	53.5	10.6	7.5	741.3	503.6
1983	67.6	55.7	68.9	55.0	−1.3	0.7	741.1	505.3
1984	81.0	68.8	70.7	56.7	10.3	12.1	752.8	518.8
1985	87.1	73.4	73.1	59.0	14.0	14.4	768.3	534.6
1986	78.8	66.2	74.3	60.1	4.5	6.1	763.2	527.8
1987	80.8	69.5	76.2	61.9	4.6	7.6	769.2	536.8

(a) Straight-line depreciation.
(b) Represents the difference between the purchase and depreciation series.
(c) Represents net value in preceding year plus net investment based on straight-line depreciation for year shown.
(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1967 to Date (r)

	All Manufacturing		Durables		Nonelectrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In Current Dollars (Billions)						
1967	$ 23.8	$19.9	$12.1	$11.2	$ 2.5	$1.4
1968	25.5	20.6	12.6	11.1	2.4	1.3
1969	29.5	23.1	14.9	12.1	3.1	1.3
1970	24.4	21.3	12.5	11.5	3.0	1.2
1971	23.9	19.3	11.0	9.8	2.8	1.3
1972	32.4	22.8	14.4	10.6	3.6	1.7
1973	47.7	35.0	22.4	16.0	4.4	2.4
1974	55.4	48.4	26.0	21.6	5.7	3.4
1975	45.4	46.4	16.3	19.9	4.0	3.6
1976	53.0	47.3	22.5	19.8	5.0	4.0
1977	66.4	55.2	26.9	23.3	5.3	4.2
1978	71.3	62.9	33.3	28.2	7.5	5.1
1979	94.1	75.5	42.6*	36.3	9.8*	7.1
1980	103.8	89.7	42.9*	40.9	8.7*	6.6
1981	103.0	94.0	42.1*	40.5	12.6*	8.0
1982	80.0	74.3	31.6*	31.3	8.1*	5.8
1983	94.8	73.8	37.6*	28.0	8.8*	5.5
1984	120.5	93.7	59.9*	40.4	12.8*	6.9
1985	102.3	96.0	51.7*	45.3	9.7*	7.5
1986	83.7	76.3	42.0*	34.3	6.6*	6.7
1987	96.1	18.0	63.4*	13.5	7.2*	5.7
In Constant 1982 Dollars (Billions)						
1967	$ 67.6	NA	$33.5	NA	$ 6.6	NA
1968	68.0	NA	33.7	NA	6.3	NA
1969	74.4	NA	37.8	NA	7.6	NA
1970	58.8	NA	30.1	NA	7.1	NA
1971	54.1	NA	25.0	NA	6.1	NA
1972	71.3	NA	31.6	NA	7.7	NA
1973	101.3	NA	48.0	NA	9.3	NA
1974	105.6	NA	51.3	NA	10.9	NA
1975	76.3	NA	27.8	NA	6.7	NA
1976	83.4	NA	35.7	NA	7.9	NA
1977	97.9	NA	40.2	NA	7.8	NA
1978	97.1	NA	46.2	NA	10.2	NA
1979	118.0	NA	54.6	NA	12.3	NA
1980	118.6	NA	50.3	NA	9.9	NA
1981	108.0	NA	45.0	NA	13.3	NA
1982	79.6	NA	31.6	NA	8.0	NA
1983	95.9	NA	37.8	NA	8.3	NA
1984	120.8	NA	60.2	NA	12.8	NA
1985	101.9	NA	51.4	NA	9.6	NA
1986	84.0	NA	42.5	NA	6.7	NA
1987	62.2	NA	22.7	NA	6.9	NA

r - Revised. NA - Not Available. * - Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1983 to Date

(Millions of Dollars)

Industry Group	1983 Total	1983 Machinery & Equipment	1984 Total	1984 Machinery & Equipment	1985 Total	1985 Machinery & Equipment
All Operating Manufacturing Establishments	$730,526	$559,622	$771,714	$591,925	$821,221	$631,665
Fabricated Metal Products	41,455	31,476	43,286	33,093	45,671	35,037
Nonelectrical Machinery	70,163	51,893	73,987	55,116	77,401	57,897
Construction & Related Machinery	12,848	9,087	12,200	8,629	11,684	8,258
Metalworking Machinery	7,603	5,834	8,157	6,253	8,619	6,638
Metal Cutting Machine Tools	1,677	1,205	1,638	1,171	1,632	1,172
Metal Forming Machine Tools	639	464	595	430	657	476
Other Metalworking Machinery	5,286	4,165	5,924	4,652	6,330	4,990
Special Industrial Machinery	4,217	2,964	4,643	3,306	4,975	3,572
General Industrial Machinery	9,382	7,012	10,126	7,624	10,534	7,990
Office & Computing Machines	14,055	10,045	15,971	11,595	17,864	13,119
Other Nonelectrical Machinery	22,058	16,951	22,890	17,709	23,725	18,320
Electrical Machinery	51,715	37,293	59,589	43,501	67,116	48,822
Transportation Equipment	61,166	44,511	66,025	48,128	72,796	53,356
Instruments & Related Products	17,313	12,085	19,126	13,403	20,655	14,771

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Annual Survey of Manufacturers."

NOTE: Data for this table was not collected in 1986.

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)

Selected Industry Groups, 1977 to Date

(Millions of Dollars)

Year: Qtr.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1977:1	$310,962	$11,443	$25,206	$15,780	$21,808	$7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1	393,630	14,681	33,204	19,480	29,982	8,343
:2	405,188	15,213	34,931	20,048	31,289	8,631
:3	418,836	15,556	36,345	20,925	32,857	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1	455,115	15,871	41,330	22,360	35,514	9,549
:2	468,348	16,309	42,619	23,204	36,913	9,826
:3	487,080	16,569	44,381	24,323	38,312	10,253
:4	515,022	18,607	46,718	26,186	39,861	10,761
1981:1	529,406	18,886	47,618	27,048	41,440	11,101
:2	547,707	19,391	49,446	28,072	42,533	11,491
:3	565,901	19,493	51,334	29,106	43,911	11,837
:4	586,077	19,846	54,078	30,817	44,746	12,425
1982:1	604,415	20,269	55,103	30,912	45,858	12,771
:2	618,376	20,952	56,950	31,808	46,481	13,047
:3	631,131	21,172	58,678	32,913	47,362	13,579
:4	643,348	21,688	59,010	33,407	48,240	13,939
1983:1	648,112	22,380	58,624	33,792	48,033	14,111
:2	653,660	21,964	58,452	33,735	47,702	14,372
:3	658,354	22,172	58,386	34,787	47,700	14,231
:4	663,282	21,464	50,403	35,921	49,406	14,797
1984:1	669,032	21,456	50,889	36,636	48,473	14,941
:2	678,085	21,814	51,033	37,804	49,622	15,164
:3	688,359	22,247	50,761	39,843	50,438	15,505
:4	704,110	23,324	50,967	41,996	50,178	17,040
1985:1	703,569	23,249	51,305	42,107	51,284	18,026
:2	709,226	23,636	52,279	42,757	52,567	18,433
:3	714,467	23,375	52,554	42,273	54,421	18,844
:4	719,861	24,659	52,340	45,754	57,602	19,196
1986:1	731,689	24,921	51,893	44,619	64,241	19,091
:2	730,942	24,944	51,771	42,537	66,312	19,550
:3	733,158	24,980	51,942	43,328	68,572	19,408
:4(r)	729,310	25,371	52,810	42,619	70,457	19,012
1987:1	725,877	25,056	52,512	42,674	70,803	18,206
:2	725,987	25,123	52,676	43,488	70,488	18,092
:3	733,095	24,610	52,179	43,347	70,997	18,208
:4(p)	741,529	25,115	52,814	43,637	71,590	18,403

p - Preliminary. r - Revised.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Bureau of the Census, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Short-term Rates, 1971 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1971	6.48%	6.59%	6.01%	6.51%	6.18%
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.70
1981	19.56	19.91	19.99	21.11	17.23
1982	14.69	17.13	17.11	13.27	11.26
1983	10.64	10.20	10.31	11.09	10.95
1984	12.02	11.06	12.45	13.29	11.29
1985	9.74	10.10	9.90	9.27	9.68
1986	8.11	9.29	8.13	7.73	7.28
1987	8.27	7.84	8.66	8.20	8.37

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Long-term Rates, 1971 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1971	6.57%	6.82%	6.36%	6.67%	6.44%
1972	6.12	5.64	5.87	6.31	6.67
1973	8.83	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.08	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94
1982	15.25	16.59	16.96	15.22	12.24
1983	12.01	11.81	11.46	11.83	12.94
1984	12.89	11.92	13.12	13.81	12.69
1985	10.72	11.10	11.03	10.44	10.31
1986	9.08	10.26	9.07	8.73	8.24
1987	9.19	9.14	9.44	8.78	9.41

Source: Federal Reserve Board.

COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1970 to Date

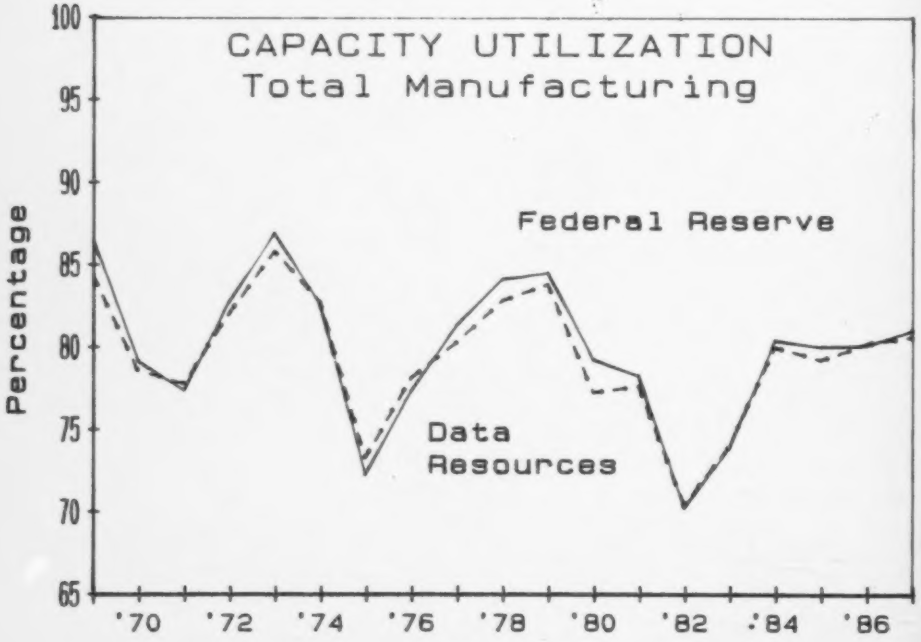
Year	Federal Reserve Board	Bureau of Economic Analysis	Data Resources, Inc.
1970	79.2%	81%	78.6%
1971	77.4	80	77.8
1972	82.8	83	82.1
1973	87.0	86	85.9
1974	82.6	83	82.8
1975	72.3	77	73.3
1976	77.4	81	78.2
1977	81.4	83	80.4
1978	84.2	84	82.9
1979	84.6	83	83.9
1980	79.3	78	77.3
1981	78.3	76	77.7
1982	70.3	70	70.5
1983	74.0	74	74.1
1984	80.5	(a)	80.1
1985	80.1	(a)	79.3
1986(r)	80.2	(a)	80.3
1987(p)	81.1	(a)	80.7

p - Preliminary. r - Revised.

(a) The publication of this data was discontinued in 1983.

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; Data Resources, Inc.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING

Federal Reserve Board, Operating Rates (a)

1969 to Date

Year	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles(b)	Primary Metals	Fabricated Metals
1969	86.7%	86.1%	82.3%	86.0%	90.5%	91.7%	83.3%
1970	79.2	76.1	73.5	77.9	68.8	83.0	74.4
1971	77.4	73.3	70.0	69.0	82.2	76.7	72.1
1972	82.8	79.7	76.8	77.6	86.0	85.8	77.4
1973	87.0	86.2	84.2	86.6	94.5	96.6	84.0
1974	82.6	81.6	79.9	87.1	78.4	92.1	78.8
1975	72.3	69.6	66.0	72.0	64.5	72.9	67.3
1976	77.4	74.8	71.6	72.7	81.1	80.7	74.0
1977	81.4	79.4	78.6	77.8	89.1	81.0	80.1
1978	84.2	82.9	83.3	82.1	89.0	87.0	83.8
1979	84.6	84.1	87.2	84.2	78.2	88.6	85.5
1980	79.3	77.9	84.6	79.2	57.8	74.7	78.4
1981	78.3	76.7	80.0	78.5	59.0	78.3	77.3
1982	70.3	66.9	70.5	67.0	54.3	54.2	65.4
1983	74.0	70.3	72.7	66.4	68.9	62.0	67.2
1984	80.8	79.0	80.2	76.5	82.5	72.5	77.4
1985	80.3	78.3	73.7	74.9	83.9	73.1	81.0
1986	79.8	76.7	71.5	71.1	79.8	69.1	80.4
1987	81.1	78.4	75.4	74.6	79.2	79.3	78.2
1982 1st Qtr.	72.4	69.5	73.2	71.9	50.2	63.2	69.7
2nd Qtr.	70.8	67.8	71.8	67.9	58.1	53.6	66.4
3rd Qtr.	69.8	66.2	69.6	64.8	58.1	52.3	63.9
4th Qtr.	68.2	63.9	67.6	63.4	50.8	47.5	61.5
1983 1st Qtr.	70.2	66.0	68.6	62.4	59.4	55.2	63.3
2nd Qtr.	72.5	68.5	70.9	65.0	64.8	58.3	65.0
3rd Qtr.	75.8	72.1	74.1	68.3	72.7	64.5	68.7
4th Qtr.	77.4	74.5	77.2	70.0	78.6	69.9	71.7
1984 1st Qtr.	79.8	77.6	79.0	73.5	84.5	73.1	75.1
2nd Qtr.	80.8	78.8	79.9	76.7	81.4	72.2	77.0
3rd Qtr.	81.6	80.0	81.0	78.6	82.2	73.0	78.4
4th Qtr.	81.0	79.4	80.8	76.9	81.7	71.7	79.3
1985 1st Qtr.	80.5	79.0	77.2	75.9	84.9	73.1	80.8
2nd Qtr.	80.3	78.5	74.1	76.1	82.7	71.0	81.3
3rd Qtr.	80.3	78.1	71.5	75.0	84.9	72.9	80.7
4th Qtr.	80.0	77.7	71.9	72.6	83.1	75.2	81.2
1986 1st Qtr.	80.0	77.5	71.7	72.8	82.3	72.3	81.2
2nd Qtr.	79.5	76.4	71.2	70.9	79.8	68.1	80.1
3rd Qtr.	79.7	76.3	71.4	70.9	79.4	67.4	79.5
4th Qtr.	79.8	76.5	71.7	69.9	77.8	68.7	80.7
1987 1st Qtr.	80.0	77.5	74.7	71.9	82.3	72.1	77.5
2nd Qtr.	80.5	77.6	74.5	73.8	78.0	74.8	77.6
3rd Qtr.	81.4	78.5	75.7	75.7	76.5	81.6	77.8
4th Qtr.	82.3	80.0	76.5	76.8	80.0	88.8	79.9
1988 1st Qtr.	82.7	80.4	76.9	78.7	77.8	84.2	82.0

(a) Quarterly data is seasonally adjusted.
(b) Includes Parts.

Source: Federal Reserve Board.

CAPACITY UTILIZATION IN MANUFACTURING

Data Resources, Inc., Operating Rates, Seasonally Adjusted

1969 to Date

Year	Total Mfg.	Total Durables	Metal-working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1969	84.5%	84.0%	84.3%	81.4%	78.0%	87.9%	94.3%
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.9
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	75.3	76.6	81.3	59.3
1981	77.7	75.3	75.6	77.8	79.7	80.6	62.7
1982	70.5	66.0	67.7	65.0	74.1	68.0	59.1
1983	74.1	70.1	70.4	68.3	75.5	67.3	73.0
1984	80.1	78.3	78.6	76.8	81.1	78.2	85.4
1985	79.3	77.9	78.8	78.6	73.1	80.6	88.7
1986(r)	80.3	78.9	78.6	75.9	72.9	77.4	95.1
1987(p)	80.8	80.0	78.9	77.8	75.1	79.4	94.2
1982 1st Qtr.	71.9	68.1	69.2	68.0	76.1	72.5	52.7
2nd Qtr.	70.9	67.0	69.0	65.9	75.4	68.8	63.4
3rd Qtr.	70.5	66.0	67.8	64.8	73.5	66.8	64.0
4th Qtr.	68.6	63.0	64.9	61.5	71.2	63.9	56.1
1983 1st Qtr.	70.0	65.2	66.8	63.3	71.6	62.5	63.7
2nd Qtr.	72.9	68.5	68.5	66.4	74.3	65.8	69.2
3rd Qtr.	76.3	72.2	72.0	71.2	76.7	69.8	77.3
4th Qtr.	77.6	74.4	74.1	72.4	79.4	71.3	81.8
1984 1st Qtr.	79.5	77.5	77.3	74.9	81.6	74.6	87.0
2nd Qtr.	80.3	78.3	78.2	76.6	81.4	77.4	84.6
3rd Qtr.	80.9	79.2	79.9	77.9	81.7	80.7	85.3
4th Qtr.	79.6	78.2	79.2	77.5	79.7	80.1	84.6
1985 1st Qtr.	79.2	78.1	79.3	78.3	76.6	80.3	87.9
2nd Qtr.	79.3	77.9	79.1	78.9	73.9	81.5	87.5
3rd Qtr.	79.3	77.8	78.6	78.3	71.2	80.5	90.3
4th Qtr.	79.2	77.6	78.2	79.0	70.7	80.2	88.8
1986 1st Qtr.(r)	79.9	78.4	78.7	78.2	71.0	79.8	92.1
2nd Qtr.(r)	80.1	78.5	78.3	75.9	72.1	77.0	95.0
3rd Qtr.(r)	80.7	79.3	78.8	74.0	74.2	76.8	97.6
4th Qtr.(r)	80.6	79.3	78.4	75.4	74.4	76.1	95.5
1987 1st Qtr.(r)	80.4	79.4	78.8	75.9	74.8	76.3	99.2
2nd Qtr.(p)	80.4	79.0	78.3	76.7	74.3	78.5	93.2
3rd Qtr.(p)	80.9	79.9	78.6	77.8	75.3	80.6	90.6
4th Qtr.(p)	81.3	81.6	79.8	80.6	75.8	82.0	93.9
1988 1st Qtr.(p)	81.2	81.0	80.1	83.5	76.0	84.2	90.5

p - Preliminary. r - Revised.

Source: Data Resources, Inc.

INDUSTRIAL PRODUCTION INDEXES

Major and Selected Industry Groupings, 1967 to Date

1977 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1967	73.5	73.1	77.0	91.4	82.5	68.9
1968	77.6	77.2	80.8	94.7	86.9	69.5
1969	81.2	80.6	84.0	101.9	88.4	75.2
1970	78.5	77.0	77.6	94.8	81.9	72.8
1971	79.6	78.2	77.3	89.9	81.5	67.6
1972	87.3	86.4	86.3	100.7	89.4	78.5
1973	94.4	94.0	96.3	114.3	99.4	91.7
1974	93.0	92.6	94.3	110.7	95.4	97.7
1975	84.8	83.4	82.6	88.2	82.7	84.5
1976	92.6	91.9	91.1	98.7	91.6	88.8
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	106.5	107.1	108.2	107.0	105.7	111.7
1979	110.7	111.5	113.9	108.5	109.4	122.6
1980	108.6	108.2	109.1	90.4	101.8	123.3
1981	111.0	110.5	111.1	95.0	101.6	129.8
1982	103.1	102.2	99.9	65.8	86.6	115.6
1983	109.2	110.2	107.7	73.0	89.1	118.3
1984	121.8	123.9	124.8	82.4	102.8	142.0
1985	124.6	127.1	128.2	80.6	107.9	146.4
1986	125.0	129.1	127.9	75.8	107.4	141.9
1987	129.8	134.7	133.1	81.3	111.0	152.7

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES

(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aerospace and Misc.	Instruments
1967	64.5	83.2	58.2	132.5	51.4
1968	68.1	90.4	69.7	130.0	56.6
1969	72.5	89.7	70.0	127.0	60.8
1970	69.3	75.3	56.3	111.9	60.3
1971	69.6	81.5	70.6	100.4	63.2
1972	79.7	87.0	77.1	103.7	70.9
1973	90.7	99.1	89.8	114.7	80.9
1974	89.8	90.1	77.5	111.3	85.7
1975	77.2	81.0	65.7	106.7	81.4
1976	86.8	92.2	86.5	101.7	89.4
1977	100.0	100.0	100.0	100.0	100.0
1978	112.9	106.3	104.6	108.7	111.5
1979	125.7	108.3	95.9	125.1	118.7
1980	130.3	96.9	71.1	132.0	122.0
1981	134.1	95.1	71.6	127.0	126.3
1982	128.4	87.6	66.8	115.7	125.3
1983	143.8	99.2	85.8	117.4	123.2
1984	172.4	113.6	105.6	124.4	136.9
1985	169.3	123.2	112.8	137.5	139.8
1986	166.5	125.8	110.9	146.1	141.3
1987	172.3	129.2	111.8	152.8	143.9

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING

Indexes, 1948 to Date

1977 = 100

Year	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1948	46.6	37.0	79.4	19.4	49.0	41.8
1949	48.5	35.1	72.4	20.3	51.7	41.9
1950	51.1	40.0	78.2	21.4	53.8	41.8
1951	53.1	44.7	84.2	23.5	54.9	44.3
1952	54.1	46.2	85.4	25.1	57.2	46.3
1953	55.3	49.6	89.8	26.4	59.9	47.8
1954	56.0	46.0	82.1	27.6	62.3	49.3
1955	58.7	50.8	86.6	28.7	64.9	48.9
1956	58.3	51.3	87.9	30.5	68.1	52.3
1957	59.6	51.5	86.5	32.3	69.7	54.3
1958	59.3	47.0	79.4	33.8	70.9	57.1
1959	61.9	52.4	84.6	35.1	73.0	56.7
1960	62.2	52.5	84.4	36.5	74.8	58.7
1961	64.0	52.6	82.3	37.6	76.1	58.7
1962	66.7	57.1	85.6	39.0	78.2	58.5
1963	71.2	61.6	86.5	40.2	79.6	56.4
1964	74.6	66.0	88.4	41.9	81.7	56.1
1965	76.6	71.7	93.6	42.7	82.0	55.8
1966	77.4	77.2	99.7	44.6	83.3	57.7
1967	77.4	77.0	99.5	46.9	85.1	60.6
1968	79.8	80.9	101.4	50.2	87.5	62.9
1969	80.8	83.2	103.0	53.7	88.8	66.5
1970	80.8	78.6	97.3	57.4	89.5	71.0
1971	85.3	79.9	93.7	60.9	91.1	71.4
1972	89.0	87.0	97.7	64.2	92.9	72.1
1973	93.4	96.3	103.1	68.8	93.8	73.7
1974	90.6	91.7	101.2	76.2	93.6	84.1
1975	92.9	84.9	91.4	85.1	95.9	91.7
1976	97.1	93.1	95.9	92.1	98.1	94.9
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	101.5	106.0	104.4	108.2	100.5	106.6
1979	101.4	108.1	106.5	118.6	99.1	117.0
1980	101.4	103.2	101.7	132.4	97.4	130.6
1981	103.6	104.8	101.1	145.2	96.7	140.1
1982	105.9	98.4	92.9	157.5	98.9	148.7
1983	112.0	104.7	93.5	162.4	98.8	145.0
1984	116.6	116.0	99.5	168.2	98.1	144.2
1985	121.7	120.4	98.9	176.7	99.5	145.1
1986(r)	128.8	125.9	97.8	182.7	101.0	141.8
1987(p)	132.4	130.7	98.7	185.1	98.7	139.7
1987 1st Qtr.(p)	130.4	128.0	98.1	183.9	99.6	141.0
2nd Qtr.(p)	132.3	129.3	97.7	184.8	98.9	139.6
3rd Qtr.(p)	133.4	131.6	98.7	185.4	98.3	139.0
4th Qtr.(p)	133.6	133.9	100.3	186.3	97.9	139.5
1988 1st Qtr.(p)	134.5	135.4	100.7	188.4	98.2	140.1

p - Preliminary. r - Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.
(b) Compensation per hour adjusted for changes in the CPI-U.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS
1953 to Date

		Selected Leading Indicators				
	Composite 12 Leading Indicators	Average Workweek, Mfg.	New Orders Consumer Goods	Orders for Plant & Equipment	Net Change in Inventories	Change in Sensitive Prices
Year	1967 = 100	Hours	$82 Billion	$82 Billion	$82 Billion Annual Rate	Percent
1953	67.9	40.5	37.14	8.77	2.8	–0.5
1954	58.6	39.6	34.67	7.31	–4.8	0.3
1955	66.6	40.7	44.48	9.98	16.3	0.5
1956	66.5	40.4	40.94	10.50	12.9	–0.1
1957	64.5	39.8	38.91	8.94	3.0	–0.6
1958	65.7	39.2	36.96	8.03	–3.4	0.3
1959	73.1	40.3	43.19	9.52	16.5	0.3
1960	71.3	39.7	40.66	9.28	7.7	–0.5
1961	75.2	39.8	42.79	9.47	7.3	0.1
1962	79.6	40.4	45.55	10.28	16.2	–0.2
1963	84.5	40.5	48.89	11.27	16.6	0.1
1964	90.6	40.7	53.05	14.38	15.7	0.5
1965	96.0	41.2	57.97	15.74	25.2	0.1
1966	99.0	41.4	61.72	18.17	36.9	–0.3
1967	100.0	40.6	60.89	16.74	28.8	–0.1
1968	107.2	40.7	80.59	22.09	21.0	0.5
1969	111.1	40.6	67.50	23.67	25.1	0.6
1970	105.5	39.8	61.56	20.47	8.2	–0.4
1971	113.5	39.9	64.27	21.48	19.6	0.4
1972	125.0	40.5	72.61	23.59	21.8	1.0
1973	132.2	40.7	80.89	29.25	40.0	2.3
1974	121.2	40.0	74.50	29.13	33.3	–0.1
1975	115.7	39.5	63.96	22.03	–12.8	–0.3
1976	130.9	40.1	73.01	24.72	22.1	1.1
1977	139.4	40.3	65.15	27.28	29.1	0.4
1978	145.8	40.4	85.18	31.70	36.8	1.3
1979	145.1	40.2	83.59	33.82	15.0	0.9
1980	138.2	39.7	74.26	29.97	–6.9	0.1
1981	140.9	39.8	73.96	29.28	23.9	–0.6
1982	136.8	38.9	65.15	24.77	–24.5	–0.7
1983	156.0	40.1	75.21	27.03	5.5	1.0
1984	165.7	40.7	82.28	31.78	59.2	–0.2
1985(r)	168.6	40.5	84.60	32.68	9.0	–0.4
1986(r)	179.3	40.7	80.71	34.17	13.8	0.4
1987(p)	189.6	41.0	84.69	37.61	42.9	1.4
1987 1st Qtr.(p)	186.4	40.8	83.65	34.44	47.6	0.5
2nd Qtr.(p)	189.0	40.8	84.40	37.48	39.0	1.3
3rd Qtr.(p)	191.8	40.8	84.52	39.05	24.6	2.3
4th Qtr.(p)	191.0	41.5	86.17	39.46	60.5	1.3
1988 1st Qtr.(p)	191.4	40.9	85.85	42.46	31.2	0.2

p - Preliminary. r - Revised.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1982 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly); "Survey of Current Business" (monthly).

Eleven economic indicators normally precede changes in the business year. These are the "leading indicators," five of which are shown separately in the table together with the composite of the 11.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough		Peak		Expansion Duration (in Months)(a)
Dec.	1854	June	1857	30
Dec.	1858	Oct.	1860	22
June	1861	Apr.	1865	46(b)
Dec.	1867	June	1869	18
Dec.	1870	Oct.	1873	34
Mar.	1879	Mar.	1882	36
May	1885	Mar.	1887	22
Apr.	1888	July	1890	27
May	1891	Jan.	1893	20
June	1894	Dec.	1895	18
June	1897	June	1899	24
Dec.	1900	Sept.	1902	21
Aug.	1904	May	1907	33
June	1908	Jan.	1910	19
Jan.	1912	Jan.	1913	12
Dec.	1914	Aug.	1918	44(b)
Mar.	1919	Jan.	1920	10
July	1921	May	1923	22
July	1924	Oct.	1926	27
Nov.	1927	Aug.	1929	21
Mar.	1933	May	1937	50
June	1938	Feb.	1945	80(b)
Oct.	1945	Nov.	1948	37
Oct.	1949	July	1953	45(b)
May	1954	Aug.	1957	39
Apr.	1958	Apr.	1960	24
Feb.	1961	Dec.	1969	106(b)
Nov.	1970	Nov.	1973	36
Mar.	1975	Jan.	1980	58
July	1980	July	1981	12
Nov.	1982			
Average Peacetime Cycles:				
25 cycles, 1854–1981				27
11 cycles, 1919–1981				31
6 cycles, 1945–1981				34

(a) Time period from trough to peak.
(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES
Major Industry Groups, 1971 to Date
(Current Cost(a) in Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1971	$102.7	$ 66.3	$ 9.1	$ 8.0	$24.2	$ 4.0
1972	108.2	70.3	9.6	8.5	25.3	4.3
1973	124.6	81.4	10.0	9.9	29.8	4.5
1974	157.8	101.7	13.4	13.4	37.5	4.9
1975	159.9	102.9	15.7	13.1	37.1	5.7
1976	175.2	112.6	17.6	14.4	37.7	6.5
1977	189.2	121.6	18.2	15.6	41.6	6.1
1978	210.5	137.9	19.4	17.3	49.4	6.4
1979	241.1	160.5	22.4	19.2	60.0	8.4
1980	264.3	174.6	23.0	19.6	68.5	10.7
1981	282.6	186.3	25.8	20.3	73.0	13.4
1982	311.4	200.7	24.2	21.5	79.7	18.8
1983	312.2	200.2	22.4	21.9	74.3	21.5
1984	334.2	218.5	22.2	22.9	80.9	27.6
1985	326.8	213.8	19.7	22.3	76.5	31.5
1986(r)	318.2	207.9	17.2	21.2	71.7	34.0
1987(p)	333.7	216.8	17.5	22.1	73.8	37.0

p - Preliminary. r - Revised.

(a) Data prior to 1982 is based on Book Value.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-1986" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES
Selected Industry Groups, 1971 to Date
(Current Cost(a) in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1971	$14.2	$ 9.4	$ 4.2	$ 9.6	$ 3.0
1972	15.1	9.9	4.7	10.1	3.2
1973	18.4	12.1	5.8	10.7	3.8
1974	24.1	14.0	6.7	12.5	4.9
1975	24.1	13.0	6.1	13.5	4.8
1976	25.3	14.5	8.0	13.1	5.4
1977	27.3	16.4	9.2	13.3	6.0
1978	31.7	18.9	10.3	15.8	6.9
1979	37.1	23.0	10.9	20.7	7.9
1980	40.7	25.9	9.9	26.1	9.1
1981	43.5	28.4	9.1	28.5	9.7
1982	48.1	30.6	8.4	34.6	11.3
1983	44.7	32.0	10.0	34.3	11.5
1984	48.3	38.2	11.5	38.9	12.5
1985	45.5	38.2	11.6	40.4	12.7
1986(r)	41.5	38.9	11.1	41.7	12.6
1987(p)	41.4	40.0	11.4	46.7	12.7

p - Preliminary. r - Revised.

(a) Data prior to 1982 is based on Book Value.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-1986" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Major Industry Groups, 1971 to Date

(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1971	$ 671.9	$ 360.1	$ 51.3	$ 44.4	$ 90.2	$ 19.0
1972	770.0	420.8	61.4	52.9	103.5	20.8
1973	915.1	515.2	80.8	64.8	131.7	23.7
1974	1,047.2	562.2	99.0	74.4	152.1	25.7
1975	1,021.8	504.2	74.1	64.4	132.1	24.8
1976	1,194.5	616.8	94.5	76.2	153.6	31.1
1977	1,380.4	733.0	105.5	91.5	183.5	35.2
1978	1,578.6	868.1	124.6	104.6	233.5	41.8
1979	1,768.8	953.4	139.6	116.6	278.8	34.1
1980	1,873.9	952.3	134.1	115.3	279.1	58.7
1981	2,013.0	1,002.6	137.0	122.4	288.6	59.1
1982	1,939.2	932.1	98.9	112.0	257.6	80.0
1983	2,087.0	1,049.8	112.7	120.7	265.7	98.6
1984	2,280.8	1,186.5	117.1	136.9	320.6	104.2
1985	2,287.6	1,195.2	110.2	137.6	323.6	110.3
1986	2,273.8	1,201.6	102.2	135.0	320.1	110.1
1987(p)	2,439.2	1,292.1	116.5	134.9	355.5	110.9

p - Preliminary.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS

Major Industry Groups, 1971 to Date

(Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1971	$106.8	$101.7	$ 7.4	$13.5	$49.4	$19.6
1972	121.1	114.7	10.3	15.1	54.6	19.7
1973	161.3	153.9	18.5	21.1	70.5	22.0
1974	191.1	185.6	21.9	28.2	86.8	26.3
1975	173.8	165.9	15.1	24.1	79.4	28.1
1976	182.5	174.2	16.8	23.0	81.7	32.0
1977	203.5	195.0	17.2	24.5	90.9	37.2
1978	259.8	249.5	23.9	27.8	117.0	47.7
1979	302.1	290.9	26.1	30.9	149.2	49.0
1980	323.4	312.6	26.3	30.1	156.0	67.1
1981	319.1	309.1	21.4	28.9	146.9	78.1
1982	306.3	297.3	14.9	22.5	126.4	101.6
1983	338.8	328.1	19.2	21.0	120.4	125.6
1984	365.2	355.1	17.1	22.0	130.0	146.0
1985	373.5	363.0	17.0	20.0	129.8	159.5
1986(r)	373.0	361.9	17.3	18.9	127.8	162.1
1987(p)	403.5	389.9	22.3	19.6	146.3	163.0

p - Preliminary. r - Revised.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Selected Industry Groups, 1971 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1971	$ 56.1	$ 48.5	$ 22.5	$ 67.4	$ .9
1972	70.9	54.1	21.0	75.5	1.4
1973	69.2	64.7	26.7	91.5	2.6
1974	105.3	67.8	29.9	84.1	2.6
1975	92.7	62.8	26.9	82.2	1.3
1976	107.4	77.0	31.9	111.7	2.2
1977	126.7	92.5	40.8	134.1	3.0
1978	154.5	106.8	54.9	158.2	4.3
1979	174.6	121.6	68.3	154.2	5.6
1980	180.6	135.6	73.1	129.0	4.8
1981	200.5	144.7	64.1	139.6	2.9
1982	170.1	154.9	70.7	136.1	1.5
1983	179.9	168.5	87.7	172.0	1.7
1984	215.4	138.4	92.1	200.5	2.9
1985	213.0	200.4	101.0	205.4	2.5
1986	199.6	207.8	104.5	214.1	2.1
1987(p)	215.1	226.8	115.8	223.5	2.1

p - Preliminary.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly); NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS
Selected Industry Groups, 1971 to Date
(Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1971	$22.2	$17.2	$ 26.4	$ 9.6	$ .6
1972	27.5	18.0	26.2	11.5	1.0
1973	38.9	22.0	27.8	17.4	2.1
1974	51.9	24.0	30.4	20.6	2.6
1975	48.9	22.7	28.1	18.4	1.5
1976	50.8	25.9	28.9	19.6	1.6
1977	55.4	30.1	37.3	19.1	2.3
1978	66.8	36.5	54.8	26.0	3.6
1979	75.0	42.2	75.1	27.0	5.4
1980	74.8	49.3	89.7	27.9	5.5
1981	73.8	53.8	89.1	27.0	3.3
1982	57.7	63.7	96.8	29.3	1.2
1983	58.7	73.1	109.6	34.3	1.0
1984	63.8	84.1	122.7	29.3	1.7
1985	61.8	91.8	132.7	24.1	1.7
1986(r)	55.3	93.8	137.7	23.3	1.2
1987(p)	57.7	96.2	152.2	24.6	1.0

p - Preliminary. r - Revised.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly); NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1971 to Date
(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1971	$ 671.1	$ 359.7	$ 51.6	$ 45.7	$ 88.5	$ 19.7
1972	756.3	408.3	58.4	51.5	97.9	20.2
1973	875.2	476.2	72.7	58.9	115.8	21.4
1974	1,017.5	530.7	95.6	67.3	135.9	21.3
1975	1,039.1	523.9	80.8	68.5	139.6	23.0
1976	1,185.6	608.3	93.0	77.4	151.4	26.7
1977	1,358.4	711.2	103.2	90.0	174.5	30.1
1978	1,522.9	814.2	118.1	101.3	207.6	31.2
1979	1,727.2	912.7	137.4	113.6	247.1	32.9
1980	1,852.7	930.6	133.9	116.2	272.4	40.6
1981	2,017.5	1,006.5	141.9	123.7	297.7	48.2
1982	1,960.2	952.2	104.7	119.4	281.0	60.4
1983	2,054.9	1,019.5	108.5	122.1	271.8	74.5
1984	2,254.4	1,159.5	119.1	135.9	311.1	83.8
1985	2,279.1	1,187.2	110.3	139.6	323.8	96.8
1986	2,273.3	1,201.7	101.7	136.0	321.8	106.9
1987(p)	2,408.6	1,263.9	111.5	134.2	337.0	110.0

p - Preliminary.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1971 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1971	$ 56.0	$ 48.0	$ 58.2	$ 30.6	$13.5	$1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977	122.2	88.4	117.7	49.2	28.9	2.3
1978	143.2	100.5	132.0	56.8	33.7	3.0
1979	166.5	116.0	131.4	70.2	37.7	3.9
1980	180.7	128.6	104.6	82.0	44.1	4.7
1981	201.5	140.2	117.0	88.2	48.3	5.1
1982	187.9	147.9	112.3	89.1	51.8	3.6
1983	179.0	159.2	147.3	96.8	53.6	1.8
1984	210.4	187.6	179.3	101.9	59.4	2.3
1985	215.1	192.7	188.5	112.8	61.0	2.5
1986	205.8	205.6	194.7	119.4	60.9	2.6
1987(p)	212.6	224.5	201.2	122.2	63.3	2.3

p - Preliminary.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1982-1986" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1981 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1981	1982	1983	1984	1985	1986	1987(p)
Metalworking Machinery Industry (SIC 354) (a)							
Jan.	$ 885	$ 923	$ 624	$ 615	$ 599	$ 629	$ 589
Feb.	1,091	960	628	696	719	762	720
Mar.	1,150	993	649	767	860	845	906
Apr.	1,018	821	595	706	671	703	674
May	971	791	596	710	716	696	722
June	1,114	889	610	733	825	819	839
July	860	718	530	619	694	604	613
Aug.	930	761	598	659	673	629	610
Sept.	1,115	767	719	779	833	839	855
Oct.	1,029	674	699	800	850	873	834
Nov.	912	650	649	686	732	768	822
Dec.	943	664	658	816	856	756	829
TOTAL	$12,018	$9,611	$7,555	$8,586	$9,028	$8,923	$9,013
Machine Tools (SIC 3541 & 3542)(b)							
Jan.	$ 389	$ 384	$ 153	$ 113	$ 138	$ 146	$ 148
Feb.	422	360	158	147	166	203	147
Mar.	477	411	176	189	228	249	183
Apr.	448	303	151	159	170	210	172
May	411	296	136	210	177	230	209
June	509	409	183	204	239	312	233
July	367	250	112	194	195	190	198
Aug.	325	257	113	164	216	151	158
Sept.	442	276	132	211	244	208	200
Oct.	407	201	145	208	199	243	210
Nov.	408	194	148	212	199	167	178
Dec.	491	264	238	276	347	271	288
TOTAL	$5,096	$3,604	$1,845	$2,286	$2,545	$2,579	$2,324

p - Preliminary.

(a) Adjusted for trading-day and calendar month variation.

(b) Shipments of new machine tools and accessories ordered with them.

Note: Individual items may not add to totals due to rounding.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-86" and Series M3-1 (monthly); NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled almost $2.5 billion by 1975, dropped by 16% in 1976, grew to almost $5.1 billion in 1981. In 1982 shipments fell 29% and declined another 49% to $1.8 billion in 1983. In 1984 and 1985 shipments rose 24% and 11%, respectively. Shipments in 1986 increased a marginal 1%, but fell by 10% in 1987.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS
Monthly, 1981 to Date
(Millions of Dollars, Not Seasonally Adjusted)

Month	1981	1982	1983	1984	1985	1986	1987(p)
Metalworking Machinery Industry (SIC 354)(a)							
Jan.	$ 898	$ 684	$ 480	$ 703	$ 707	$ 638	$ 636
Feb.	948	603	589	772	825	708	665
Mar.	1,059	596	579	780	968	793	890
Apr.	880	540	585	732	787	714	725
May	742	560	626	806	774	738	701
June	891	754	648	759	943	684	781
July	648	524	593	982	862	677	719
Aug.	807	635	722	806	684	640	659
Sept.	781	516	672	849	832	782	891
Oct.	790	557	775	728	842	736	718
Nov.	648	511	686	724	577	702	775
Dec.	475	524	561	896	465	578	735
TOTAL	$9,567	$7,004	$7,516	$9,537	$9,266	$8,390	$8,895
Machine Tools (SIC 3541 & 3542)(b)							
Jan.	$ 291	$ 205	$ 92	$ 189	$ 211	$ 191	$ 147
Feb.	280	164	98	203	238	210	153
Mar.	350	138	126	208	279	215	164
Apr.	320	151	119	253	184	193	130
May	229	106	135	320	223	206	188
June	318	126	145	192	235	201	203
July	192	107	175	313	200	170	163
Aug.	214	87	137	201	185	154	142
Sept.	187	87	156	286	174	135	183
Oct.	216	119	203	284	230	180	267
Nov.	196	88	160	212	195	133	137
Dec.	152	121	151	255	175	137	241
TOTAL	$2,945	$1,498	$1,696	$2,916	$2,528	$2,125	$2,119

p - Preliminary.

(a) Adjusted for trading-day and calendar month variation.
(b) Net new orders for new machine tools and accessories ordered with them.

Note: Individual items may not add to totals due to rounding.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-86" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders. These generally follow the overall movement of the economy but the cycles involved are much more pronounced. For example, in 1975 new orders were only 45% of the level experienced in 1973. However, the economic recovery following the 1974 recession was especially strong in the machine tool sector and by 1979 orders were running at record levels, well in excess of $5 billion per year. This strength in machine tool orders continued into early 1980, and then began a long, steady decline until late 1982. As a mark of the severity of the recession, machine tool orders for 1982 were only 27% of their 1979 record total. Monthly order placements demonstrated gradual improvement throughout 1983, and in 1984 there was a dramatic year-to-year increase of 72%. Since 1984, net new orders have declined every year. The failure of the industry to experience a recovery in step with the general economy has threatened the future of many domestic machine tool building firms. Fortunately, the fourth quarter of 1987 was a relatively strong one for machine tool orders and the early figures for 1988 have continued to be at levels substantially higher than in recent years.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1981 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1981	1982	1983	1984	1985	1986	1987(p)
Metalworking Machinery Industry (SIC 354)(a)							
Jan.	$7,422	$4,806	$2,294	$2,487	$3,458	$3,597	$3,102
Feb.	7,279	4,447	2,255	2,563	3,564	3,543	3,047
Mar.	7,188	4,052	2,185	2,576	3,672	3,491	3,031
Apr.	7,050	3,771	2,175	2,602	3,788	3,502	3,082
May	6,821	3,540	2,205	2,698	3,846	3,544	3,061
June	6,598	3,405	2,243	2,724	3,964	3,409	3,003
July	6,386	3,211	2,306	3,087	4,132	3,482	3,109
Aug.	6,263	3,085	2,430	3,234	4,143	3,493	3,158
Sept.	5,929	2,834	2,383	3,304	4,142	3,436	3,194
Oct.	5,690	2,717	2,459	3,232	4,134	3,299	3,078
Nov.	5,426	2,578	2,496	3,270	3,979	3,233	3,031
Dec.	4,958	2,438	2,399	3,350	3,588	3,055	2,937
Machine Tools (SIC 3541 & 3542)(b)							
Jan.	$5,353	$3,122	$1,133	$1,121	$1,748	$1,702	$1,203
Feb.	5,211	2,926	1,072	1,176	1,840	1,710	1,210
Mar.	5,083	2,653	1,021	1,196	1,871	1,676	1,191
Apr.	4,956	2,500	989	1,290	1,885	1,660	1,149
May	4.773	2,310	988	1,400	1,930	1,636	1,129
June	4,583	2,027	950	1,388	1,927	1,526	1,098
July	4,408	1,883	1,013	1,507	1,932	1,506	1,064
Aug.	4,296	1,713	1,037	1,544	1,900	1,509	1,047
Sept.	4,042	1,524	1,062	1,619	1,830	1,436	1,030
Oct.	3,852	1,442	1,119	1,695	1,861	1,373	1,087
Nov.	3,639	1,337	1,131	1,695	1,857	1,339	1,047
Dec.	3,300	1,194	1,045	1,675	1,656	1,204	1,000

p - Preliminary.

(a) Adjusted for trading-day and calendar month variation.
(b) Net new orders for new machine tools and accessories ordered with them.

Note: Individual items may not add to totals due to rounding.

Sources: U. S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1982-86" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

Because they must incorporate a variety of customer-specified options, machine tools are generally "built to order" rather than being built for inventory. This order-taking procedure results in the backlog of unfilled orders, machines ordered by customers but not yet shipped, for which statistics appear above. The backlog of unfilled orders for machine tools, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. The slack pace of the economy since then saw the accumulated volume of unfilled orders drop to just $1.0 billion by the end of 1983. The order recovery in 1984 led to a sharp increase for the year but total outstanding unfilled order levels in 1984–1987 were nonetheless in line with prevailing shipping rates. The backlog of unfilled orders has increased sharply in the first few months of 1988 as a result of the upswing in orders.

PRODUCER PRICE INDEXES
For Selected Machine Tool Materials and Components

1982 = 100, unless otherwise indicated

Commodity	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Finished Goods	69.8	77.6	88.0	96.1	100.0	101.6	103.7	104.7	103.2	105.4
All Commodities	69.9	78.7	89.8	98.0	100.0	101.3	103.7	103.2	100.2	102.8
Industrial Commodities	67.0	75.7	88.0	97.4	100.0	101.1	103.3	103.7	100.0	102.6
Durable Manufactured Goods	73.2	80.8	89.6	96.4	100.0	102.7	105.0	106.5	107.5	109.6
Industrial Power, 500 KW Demand	59.1	64.5	77.8	89.2	100.0	103.1	108.4	112.8	114.5	112.1
Prepared Paint	73.2	77.8	89.5	95.1	100.0	100.7	103.7	105.3	107.0	108.1
Iron and Steel	74.8	83.6	90.0	98.5	100.0	101.3	105.3	104.8	101.1	104.5
Foundry and Forge Shop Products	72.2	80.2	89.7	95.4	100.0	101.6	104.4	105.2	105.2	105.6
Gray & Ductile Iron Cast	NA	NA	NA	95.1	100.0	99.9	101.0	103.3	103.7	103.4
Steel Mill Products	72.8	80.2	86.6	96.6	100.0	100.9	104.7	104.7	99.8	102.3
Semi-finished Steel Products	73.1	79.5	88.0	97.1	100.0	100.1	100.3	100.3	99.0	100.2
Finished Steel Products	72.8	80.3	86.6	96.6	100.0	100.5	104.3	104.5	99.9	102.3
Nonferrous Metals	78.8	99.3	115.7	108.4	100.0	104.7	105.1	99.6	98.5	108.7
Primary Nonferrous Metals	76.8	103.9	132.7	114.7	100.0	106.8	101.3	93.6	93.8	109.2
Nonferrous Mill Shapes	76.2	89.7	97.1	100.8	100.0	103.1	106.7	102.9	99.9	105.7
Aluminum Mill Shapes	75.9	82.8	89.3	98.3	100.0	102.2	112.0	107.8	102.6	105.5
Nonferrous Wire and Cable	76.6	92.1	107.5	102.5	100.0	100.7	99.9	100.9	101.8	106.5
Metalworking Machinery and Equipment	67.6	75.2	85.5	93.9	100.0	101.7	104.1	106.6	108.4	110.1
Cutting Tools & Access.	69.2	76.3	86.0	94.5	100.0	101.3	103.0	105.7	107.5	108.9
Abrasive Products	69.3	75.2	85.1	93.1	100.0	102.6	103.3	105.9	106.7	108.1
Metal Cutting Machine Tools	62.8	72.4	85.1	93.6	100.0	102.1	104.6	107.3	109.6	112.6
Metal Forming Machine Tools	64.9	74.1	85.7	94.0	100.0	102.7	104.7	107.0	108.7	110.2
General Purpose Machy. & Equipment	71.2	77.8	87.0	95.0	100.0	101.4	103.3	105.7	107.2	108.3
Pumps, Compressors, & Equipment	65.7	71.7	82.8	93.4	100.0	100.0	100.7	102.6	104.1	105.2
Fluid Power Equipment	66.9	72.1	81.7	91.0	100.0	103.5	106.1	108.1	109.8	111.3
Fluid Power Pumps	66.0	71.4	81.0	91.3	100.0	104.9	104.0	105.9	108.2	110.3
Fluid Power Valves	67.6	72.9	81.2	90.0	100.0	101.6	105.5	107.6	109.0	110.9
Fluid Power Hose and Tube Fittings	69.8	74.6	85.7	93.8	100.0	100.5	102.9	105.9	107.3	109.0
Mechanical Power Transmission Equipment	68.2	75.1	84.5	94.4	100.0	101.1	104.4	108.2	110.6	112.0
Miscellaneous General Purpose Equipment	68.8	76.2	86.3	94.9	100.0	100.4	103.4	106.2	107.7	109.0
Ball & Roller Bearings	62.2	68.5	80.0	91.9	100.0	100.1	102.9	105.9	107.3	107.8
Electrical Machinery and Equipment	71.2	77.2	87.1	95.1	100.0	103.7	107.4	109.6	111.2	112.7
Motors, Generators, Motor Generator Sets	70.4	75.7	86.0	95.6	100.0	106.4	109.8	113.3	113.5	115.4
Integral Elec. Motors, AC June 1983 = 100	NA	NA	NA	NA	NA	NA	109.3	110.7	106.1	105.6
Transformers and Power Regulators	70.0	74.1	82.4	94.2	100.0	100.7	102.6	105.0	105.6	107.6
Switchgear, Switchboard, etc. Equipment	69.8	75.8	88.4	95.1	100.0	103.3	105.0	106.7	108.1	110.2
Electronic Components and Accessories	72.1	77.1	88.8	95.5	100.0	104.3	109.8	112.4	114.5	115.1

NA - Not Available.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U. S. Department of Labor, Bureau of Labor Statistics.

FIXED WEIGHT PRICE INDEXES FOR NATIONAL DEFENSE PURCHASES OF GOODS AND SERVICES

By Major Type of Product, 1976 to Date

(Index 1982 = 100)

Year	Total Purchases	Durable Goods	Non-Durable Goods	Services(a)	Structures	Compensation
1976	59.7	61.7	43.4	60.3	60.4	61.4
1977	63.5	64.6	46.3	65.9	64.6	65.2
1978	68.6	70.1	50.3	70.5	72.9	69.9
1979	75.1	75.5	61.9	75.5	84.4	75.4
1980	84.7	84.9	87.9	84.2	95.4	82.8
1981	93.8	94.4	102.0	92.3	99.4	92.0
1982	100.0	100.0	100.0	100.0	100.0	100.0
1983(r)	103.7	104.0	93.1	104.9	101.4	104.7
1984(r)	107.6	109.8	89.6	107.9	103.5	109.2
1985(r)	111.1	112.3	88.3	110.3	109.0	114.6
1986(r)	112.1	112.4	70.8	114.0	117.2	117.4
1987(p)	115.3	112.9	70.4	118.5	120.7	122.2

p - Preliminary. r - Revised.

(a) Services excluding Compensation.

Source: U. S. Department of Commerce, "Survey of Current Business" (monthly).

NATIONAL DEFENSE PURCHASES

By Major Type of Product, 1976 to Date

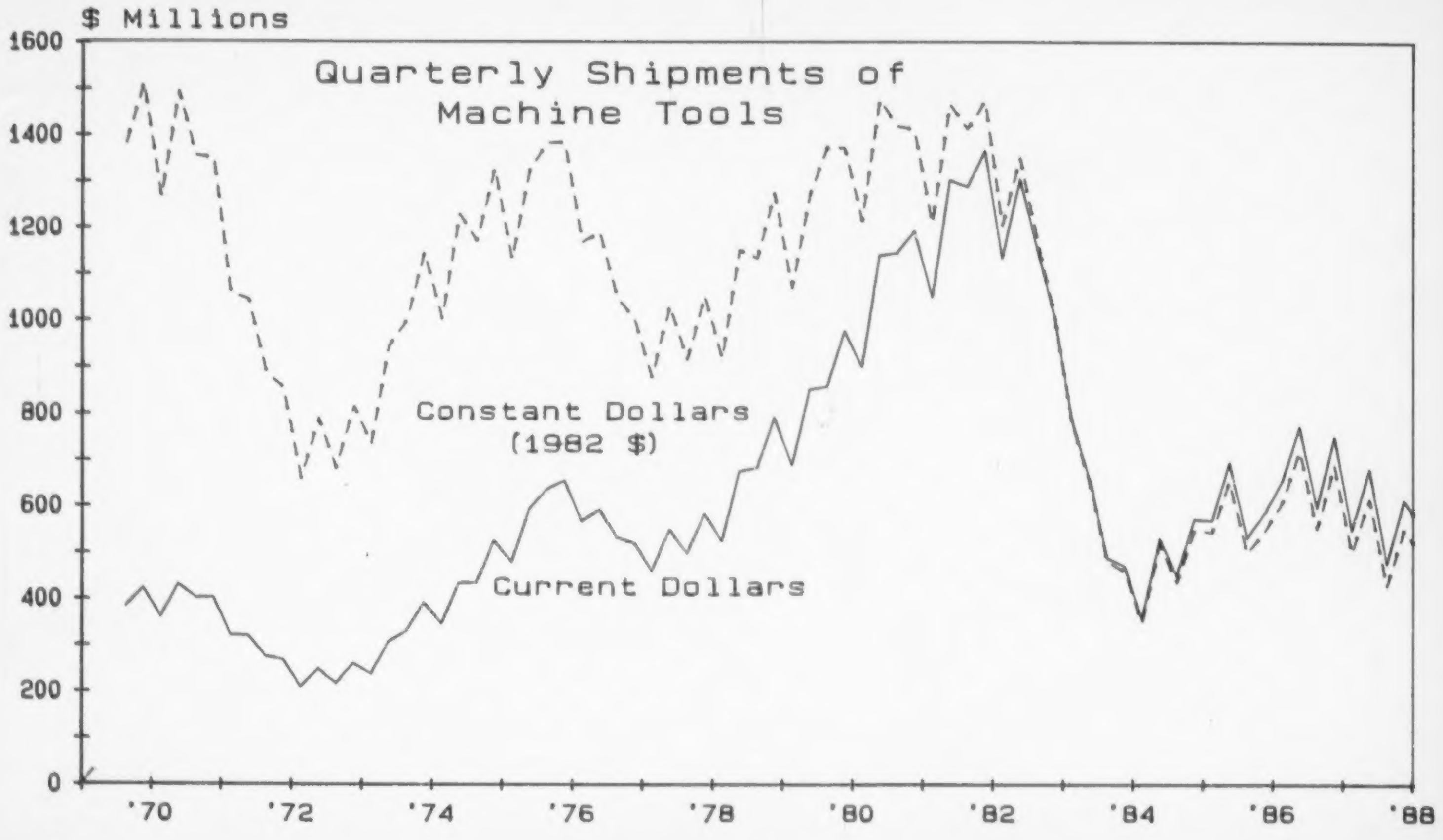
Year	Total Purchases	Durable Goods	Non-Durable Goods	Services(a)	Structures	Compensation
In Current Dollars (Billions)						
1976	$ 93.4	$18.4	$ 4.7	$18.9	$2.1	$ 49.3
1977	100.9	21.9	5.1	19.7	2.4	51.8
1978	108.9	23.6	5.6	21.4	2.5	55.8
1979	121.9	28.7	6.7	24.3	2.5	59.7
1980	142.7	33.0	10.9	29.7	3.1	66.0
1981	167.5	39.8	12.7	36.2	3.2	75.6
1982	193.8	49.2	13.6	43.1	3.9	84.0
1983(r)	214.4	58.1	12.6	49.3	4.8	89.6
1984(r)	234.3	66.0	12.1	56.5	4.9	94.8
1985(r)	259.3	75.9	11.9	64.3	6.1	101.2
1986(r)	277.8	83.9	11.1	71.9	6.6	104.3
1987(p)	295.2	89.9	10.6	78.4	7.4	108.8
In Constant 1982 Dollars (Billions)						
1976	$157.5	$30.6	$11.3	$32.0	$3.4	$ 80.2
1977	159.2	34.3	11.2	30.5	3.6	79.5
1978	160.7	35.0	11.4	31.0	3.4	79.9
1979	164.3	38.9	10.8	32.5	2.9	79.1
1980	171.2	40.3	12.4	35.6	3.3	79.7
1981	180.3	43.3	12.5	39.2	3.2	82.1
1982	193.8	49.2	13.6	43.1	3.9	84.0
1983(r)	206.9	56.1	13.5	47.0	4.8	85.6
1984(r)	218.5	61.2	13.4	52.4	4.7	86.8
1985(r)	236.7	71.3	13.3	58.3	5.6	88.3
1986(r)	250.7	77.9	15.1	63.2	5.6	86.8
1987(p)	264.2	87.7	14.5	66.8	6.1	89.1

p - Preliminary. r - Revised.

(a) Services excluding Compensation.

Source: U. S. Department of Commerce, "Survey of Current Business" (monthly).

The estimates in the above table are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.


$ Millions
Quarterly Shipments of Machine Tools
Constant Dollars (1982 $)
Current Dollars
1600
1400
1200
1000
800
600
400
200
0
'70
'72
'74
'76
'78
'80
'82
'84
'86
'88

PRODUCER PRICES INDEXES FOR MACHINE TOOLS

1948 to Date

1982 = 100

Year	All Commodities	Durable Manufactured Goods	Total(a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1948	27.7	23.3	10.5	10.5	10.6
1949	26.3	24.1	11.2	11.2	11.1
1950	27.3	24.9	12.0	12.0	12.1
1951	30.4	27.3	14.0	14.0	13.8
1952	29.6	27.4	15.0	15.0	14.5
1953	29.2	28.0	15.1	15.1	14.8
1954	29.3	28.4	15.2	15.2	14.9
1955	29.3	29.4	15.8	15.8	16.1
1956	30.3	31.3	18.1	18.0	18.2
1957	31.2	32.5	19.3	19.3	19.2
1958	31.6	32.9	19.5	19.7	19.0
1959	31.7	33.6	19.9	20.2	19.1
1960	31.7	33.6	20.5	20.8	19.7
1961	31.6	33.5	20.9	21.4	19.6
1962	31.7	33.4	21.4	21.8	20.1
1963	31.6	33.5	21.4	21.9	20.2
1964	31.6	33.8	22.3	22.8	20.9
1965	32.3	34.2	23.5	24.0	22.1
1966	33.3	35.0	25.0	25.5	23.6
1967	33.4	35.7	26.5	27.1	24.7
1968	34.2	37.0	27.5	28.0	25.7
1969	35.6	38.5	28.4	29.0	26.5
1970	36.9	40.0	30.1	30.8	28.6
1971	38.1	41.8	31.2	31.8	29.9
1972	39.8	43.3	32.1	32.6	31.0
1973	45.0	45.5	34.3	34.8	32.9
1974	53.5	53.1	40.9	41.2	40.0
1975	58.4	59.2	48.0	48.1	47.5
1976	61.1	62.7	52.0	51.8	52.6
1977	64.9	67.2	56.4	56.0	57.5
1978	69.9	73.2	63.4	62.8	64.9
1979	78.7	80.8	72.8	72.4	74.2
1980	89.8	89.6	85.2	85.1	85.7
1981	98.0	96.4	93.7	93.6	94.0
1982	100.0	100.0	100.0	100.0	100.0
1983	101.3	102.7	102.3	102.1	102.7
1984	103.7	105.0	104.7	104.7	104.7
1985	103.2	106.5	107.2	107.3	107.0
1986	100.2	107.5	109.4	109.6	108.7
1987	102.8	109.6	111.9	112.6	110.2

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA shipments weights.

Source: U. S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977," "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES

1949 to Date

(In 1982 Dollars)

Year	Total Industry(a)		Metal Cutting		Metal Forming(a)	
	Current Dollars (Thousands)	1982 Dollars (Thousands)	Current Dollars (Thousands)	1982 Dollars (Thousands)	Current Dollars (Thousands)	1982 Dollars (Thousands)
1948	$ 288,450	$2,747,143	$ 288,450	$2,747,143	—	—
1949	249,150	2,224,554	249,150	2,224,554	—	—
1950	305,550	2,546,250	305,550	2,546,250	—	—
1951	632,250	4,516,079	632,250	4,516,079	—	—
1952	1,125,900	7,506,000	1,125,900	7,506,000	—	—
1953	1,191,200	7,888,742	1,191,200	7,888,742	—	—
1954	891,750	5,866,776	891,750	5,866,776	—	—
1955	670,400	4,243,038	670,400	4,243,038	—	—
1956	1,377,300	7,625,287	945,200	5,251,111	$ 432,100	$2,374,176
1957	1,242,700	6,448,104	900,150	4,663,990	342,550	1,784,115
1958	591,200	3,029,591	438,400	2,225,381	152,800	804,211
1959	616,000	3,099,513	440,600	2,181,188	175,400	918,325
1960	744,000	3,631,284	541,500	2,603,365	202,500	1,027,919
1961	750,900	3,598,848	541,250	2,529,206	209,650	1,069,643
1962	821,250	3,848,054	612,850	2,811,239	208,400	1,036,816
1963	895,750	4,189,059	638,450	2,915,297	257,300	1,273,762
1964	1,164,350	5,234,270	844,650	3,704,605	319,700	1,529,665
1965	1,425,600	6,084,381	1,022,550	4,260,625	403,050	1,823,756
1966	1,685,200	6,754,948	1,221,750	4,791,176	463,450	1,963,771
1967	1,805,950	6,826,354	1,353,200	4,993,358	452,750	1,832,996
1968	1,726,900	6,285,313	1,358,300	4,851,071	368,600	1,434,241
1969	1,597,550	5,640,576	1,192,450	4,111,897	405,100	1,528,679
1970	1,443,050	4,797,652	992,900	3,223,701	450,150	1,573,951
1971	997,900	3,203,114	672,300	2,114,151	325,600	1,088,963
1972	1,018,700	3,173,016	714,450	2,191,564	304,250	981,452
1973	1,501,000	4,384,121	1,073,750	3,085,489	427,250	1,298,632
1974	2,030,550	4,971,095	1,445,850	3,509,345	584,700	1,461,750
1975	2,452,200	5,113,191	1,878,650	3,905,717	573,050	1,207,474
1976	2,059,650	3,959,201	1,482,100	2,861,197	557,550	1,098,004
1977	2,280,750	4,043,422	1,650,800	2,947,857	629,950	1,095,565
1978	3,013,450	4,755,982	2,188,500	3,484,873	824,950	1,271,109
1979	3,876,550	5,322,637	2,930,050	4,047,030	946,500	1,275,606
1980	4,691,750	5,504,903	3,680,800	4,325,264	1,010,950	1,179,638
1981	5,095,600	5,439,511	4,104,500	4,385,150	991,100	1,054,362
1982	3,604,400	3,604,400	2,894,750	2,894,750	709,650	709,650
1983	1,845,050	1,804,391	1,371,500	1,343,291	473,550	461,100
1984	2,285,850	2,183,236	1,606,500	1,534,384	679,350	648,854
1985	2,545,200	2,374,139	1,742,250	1,623,719	802,950	750,421
1986	2,578,500	2,357,845	1,890,300	1,724,726	688,200	633,119
1987	2,322,600	2,075,215	1,675,550	1,488,055	647,050	587,160

(a) Shipment data not available for metal forming prior to 1956.

Source: U. S. Department of Labor, Bureau of Labor Statistics, NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog (monthly)."

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,503,080 and for metal forming is $969,448.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the past twenty years. The changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth in recent years has been considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

Since 1975, the overall United States balance of trade has moved from a small surplus to record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining throughout the 1970's. Record high machine tool imports by U.S. manufacturers, combined with relatively small increases in machine tool exports, led to substantial balance of trade deficits in machine tool trade from 1978 through the present. In a little over a decade, the share of the domestic market represented by imports has grown from a negligible amount to over fifty percent of NC machine tool consumption and over forty percent of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS DOMESTIC PRODUCT (r)

1978 to Date

(Billions of U.S Dollars)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
WORLD	$8,906	$9,967	$11,041	$12,271	$13,058	$13,932	$15,008	$15,983	$16,800	NA
Of which:										
United States	2,219	2,464	2,684	3,001	3,115	3,356	3,724	3,970	4,195	$4,461
Canada	212	236	265	297	304	329	342	349	364	403
Korea	50	65	62	69	72	79	85	87	98	121
Japan	971	1,011	1,059	1,167	1,082	1,180	1,254	1,325	1,959	2,377
Australia	115	129	148	169	166	160	178	158	165	194
Belgium	97	111	120	99	87	88	78	82	115	142
France	484	583	665	582	552	526	499	552	725	875
West Germany	640	760	814	682	658	656	617	622	892	1,120
Italy	262	325	456	412	403	416	410	422	600	751
Netherlands	137	157	169	141	138	133	125	125	175	214
Spain	146	196	212	184	178	155	156	164	229	NA
Sweden	92	108	124	113	100	92	95	100	131	159
Switzerland	85	95	102	94	97	97	91	93	135	NA
United Kingdom	324	420	536	517	485	458	430	459	554	670
Saudi Arabia	66	74	116	154	153	120	106	91	77	NA
Brazil	181	201	253	266	268	205	210	226	270	NA
Mexico	159	173	186	240	167	143	171	177	NA	NA
U.S.S.R.	NA	1,396	1,540	1,723	1,867	1,989	2,089	2,157	2,356	NA
China	NA	90	99	110	119	125	132	136	145	NA
PER CAPITA WORLD	$2,059	$2,264	$2,467	$2,692	$2,817	$2,954	$3,127	$3,274	$3,382	NA
of which:										
United States	9,970	10,950	11,787	13,043	13,406	14,309	15,734	16,591	17,363	$18,282
Canada	9,017	9,945	11,062	12,199	12,333	13,223	13,622	13,751	14,198	15,587
Korea	1,355	1,719	1,637	1,783	1,840	1,969	2,109	2,114	2,365	2,880
Japan	8,454	8,725	9,071	9,919	9,139	9,894	10,452	10,975	16,124	19,441
Australia	7,999	8,857	10,090	11,357	10,967	10,410	11,413	10,023	10,352	12,000
Belgium	9,878	11,321	12,217	10,005	8,832	8,955	7,942	8,239	11,629	14,309
France	9,140	10,972	12,335	10,748	10,127	9,605	9,089	10,011	13,082	15,732
West Germany	10,422	12,390	13,242	11,056	10,668	10,680	10,084	10,197	14,611	18,365
Italy	4,663	5,777	8,080	7,287	7,116	7,316	7,196	7,387	10,484	13,103
Netherlands	9,825	11,201	11,957	9,924	9,653	9,297	8,650	8,662	12,042	14,649
Spain	3,995	5,288	5,642	4,873	4,690	4,061	4,076	4,255	5,924	NA
Sweden	11,104	13,008	14,940	13,603	11,994	11,044	11,445	11,983	15,659	18,972
Switzerland	13,382	14,989	15,904	14,632	14,921	14,984	14,149	14,329	20,833	NA
United Kingdom	5,806	7,516	9,577	9,168	8,611	8,126	7,604	8,098	9,756	11,770
Saudi Arabia	7,809	8,315	12,368	15,705	14,962	11,275	9,520	7,916	6,446	NA
Brazil	1,603	1,740	2,084	2,145	2,109	1,580	1,584	1,673	1,950	NA
Mexico	2,419	2,564	2,685	3,363	2,283	1,904	2,231	2,260	NA	NA
U.S.S.R.	NA	5,300	5,781	6,436	6,887	7,270	7,561	7,734	8,369	NA
China	NA	93	101	111	118	122	128	130	137	NA

r - Revised. NA - Not Available.

(a) Data for the World, China, and U.S.S.R. series are GNP figures.

Note: GDP measures the total value of final output of a country's economy—that is, of the goods produced and services rendered within its territory by residents and nonresidents for a given period—without regard to its allocation among domestic and foreign claims.

Source: International Monetary Fund, "International Financial Statistics"; Central Intelligence Agency, "Handbook of Economic Statistics."

INTERNATIONAL INVESTMENT PATTERNS

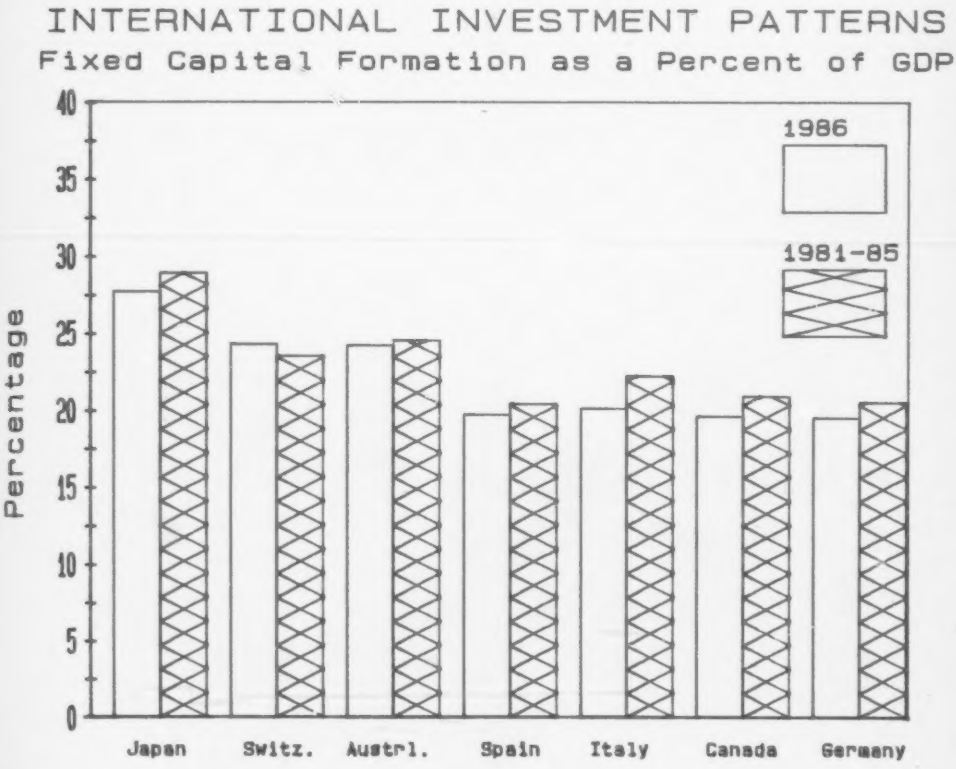
1978 to Date (r)

	Gross Fixed Capital Formation as Percent of GDP									
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
United States	20.0%	20.4%	19.3%	18.8%	17.6%	17.1%	18.0%	18.4%	18.1%	17.3%
Canada	22.6	23.0	23.3	24.2	21.8	20.1	19.0	19.4	19.6	20.8
South Korea	30.9	32.6	31.2	27.5	29.3	30.3	30.2	29.7	30.4	30.7
Japan	30.4	31.7	31.6	30.7	29.7	28.3	27.9	27.7	27.7	28.9
Australia	23.8	23.3	24.2	25.9	25.8	23.3	23.1	24.6	24.2	23.5
France	22.4	22.4	23.0	22.1	21.4	20.2	19.3	18.0	18.9	NA
West Germany	20.7	21.8	22.7	21.8	20.5	20.5	20.2	19.7	19.5	19.3
Italy	18.7	18.8	24.3	23.8	22.3	22.5	21.2	21.2	20.1	20.0
Netherlands	21.4	21.1	21.1	19.2	18.2	17.4	18.6	19.0	19.6	20.0
Spain	19.9	18.9	19.4	21.8	21.3	20.6	19.0	19.2	19.7	NA
Sweden	19.3	19.8	20.2	19.2	18.8	18.7	18.6	19.1	18.2	19.1
Switzerland	21.4	21.8	23.8	24.1	23.1	23.3	23.3	23.8	24.2	NA
United Kingdom	18.4	18.7	18.1	16.2	16.2	16.1	17.1	17.0	16.9	16.9

r - Revised. NA - Not Available.

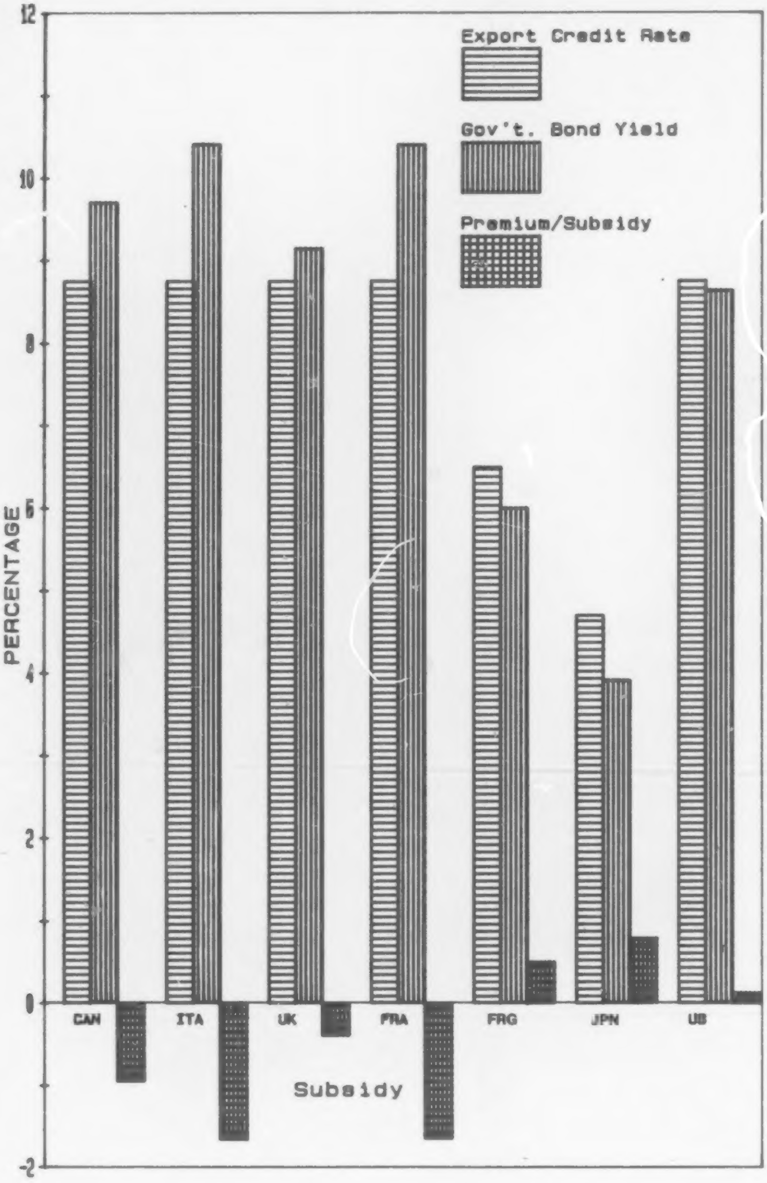
Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

Source: International Monetary Fund, "International Financial Statistics."



1987

Long-Term Rates for Official Export Credit, Government Bond Yields, and Export Premium/Subsidy



U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY— YEAR END 1986

(Billions of U.S. Dollars)

	Total	Manufacturing	Services	Petroleum	Other
Developed Countries	$194.7	$87.2	$3.9	$39.6	$64.0
Canada	50.2	23.8	0.9	10.9	14.6
Europe	123.2	54.1	2.7	24.3	42.1
European Community	99.6	52.0	2.2	18.0	27.4
United Kingdom	35.0	14.0	0.8	8.6	11.6
France	9.5	6.6	0.2	0.5	2.2
West Germany	20.3	13.0	Z	3.2	4.1
Other EEC	34.8	18.5	1.3	5.7	9.5
Other Europe	23.6	2.1	0.5	6.3	14.7
Japan	11.3	5.3	0.1	2.6	3.3
Australia, New Zealand, South Africa	10.0	4.0	0.2	1.7	4.1
Developing Countries	60.6	20.1	1.2	17.8	21.5
Latin America	35.0	15.2	0.5	5.2	14.1
Middle East (b)	5.4	0.2	0.4	2.9	1.9
Other Africa (c)	4.3	0.3	0.1	3.4	0.5
Other Asia and Pacific	16.0	4.4	0.2	6.2	5.2
Other Countries	4.6	—	—	3.8	0.8
Total	$259.9	$107.2	$5.1	$61.2	$86.4

Z - Less than $50 million.

(a) Book value.
(b) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.
(c) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1987.

INDUSTRIAL PRODUCTION (a)

1967 to Date

(1980 = 100)

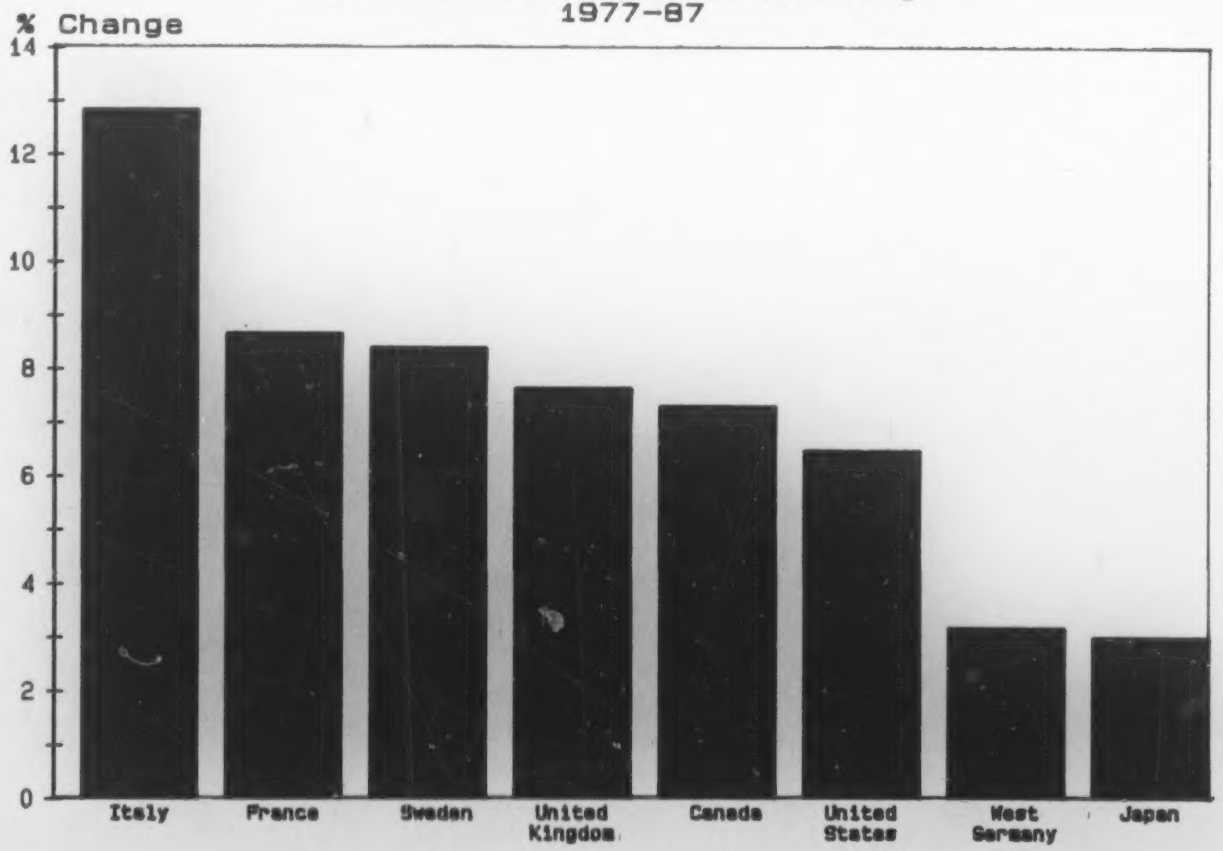
Year	United States	Canada	Japan	EEC(b,r)	United Kingdom	France	West Germany	Italy
1967	68.0	61.5	43.3	64.2	85.5	62.0	63.0	60.0
1968	72.3	65.9	50.7	69.0	91.0	65.0	69.0	63.9
1969	75.6	70.1	58.8	75.4	93.4	71.0	79.0	66.4
1970	73.3	71.3	66.9	79.2	93.5	75.0	83.0	72.1
1971	74.6	73.8	68.6	81.0	93.6	80.0	85.0	72.0
1972	81.4	79.4	73.6	84.5	95.7	84.0	88.0	75.2
1973	88.3	87.8	84.6	90.7	102.7	90.0	92.0	82.5
1974	88.0	90.6	81.2	91.4	98.7	92.0	90.0	86.2
1975	80.1	85.2	72.3	85.3	93.9	86.0	84.0	78.3
1976	88.7	90.2	80.4	91.6	95.9	93.0	91.0	87.9
1977	93.9	92.5	83.7	93.7	100.1	95.0	93.0	88.9
1978	99.4	95.0	89.0	95.9	103.3	97.0	95.0	88.8
1979	101.9	100.7	95.5	100.7	107.2	99.0	100.0	94.7
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	102.2	101.0	101.0	97.7	96.6	98.0	98.0	98.5
1982(r)	94.9	90.2	101.3	96.4	98.4	98.0	94.0	95.4
1983	100.5	95.3	104.9	97.8	101.9	99.0	95.0	92.3
1984	112.1	103.7	116.5	100.0	103.2	100.0	98.0	95.2
1985(r)	114.6	108.2	121.9	103.3	108.1	101.0	102.0	96.5
1986(r)	114.0	109.6	121.5	105.4	109.6	102.0	104.0	99.2
1987	119.5	NA	126.0	106.5E	113.7	104.0	104.0	103.0

E - Estimate. r - Revised. NA - Not Available.

(a) Excludes construction.
(b) Data for the European Economic Community (EEC) on this table contains statistics for Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, and West Germany, and also includes Greece after 1980.

Source: International Monetary Fund, "International Financial Statistics," and NMTBA

Consumer Prices
Average Annual Percent Change
1977-87



CONSUMER PRICES
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1966	39.4	39.6	34.0	23.0	33.0	55.9	24.2	35.4
1967	40.5	41.1	35.4	23.6	33.9	56.8	25.1	37.0
1968	42.2	42.7	37.3	24.7	35.5	57.8	25.5	37.7
1969	44.5	44.7	39.3	26.1	37.6	58.9	26.1	38.7
1970	47.1	46.1	42.3	27.7	39.9	60.9	27.4	41.4
1971	49.1	47.5	44.9	30.3	42.1	64.0	28.8	44.5
1972	50.8	49.7	46.9	32.5	44.7	67.6	30.4	47.2
1973	53.9	53.5	52.4	35.5	47.9	72.3	33.7	50.3
1974	59.8	59.3	65.2	41.1	54.5	77.4	40.1	55.3
1975	65.3	65.7	72.9	51.1	60.9	82.0	46.9	60.7
1976	69.1	70.7	79.7	59.6	66.8	85.5	54.8	67.0
1977	73.6	76.3	86.1	69.0	73.0	88.7	64.1	74.6
1978	79.2	83.2	89.4	74.7	79.4	91.1	71.9	82.0
1979	88.1	90.7	92.6	84.8	87.9	94.9	82.5	87.9
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	110.4	112.4	104.9	111.9	113.4	106.3	119.5	112.1
1982	117.1	124.6	107.8	121.5	126.8	111.9	139.2	121.7
1983	120.9	131.8	109.9	127.1	139.0	115.6	159.5	132.6
1984(r)	126.1	137.5	112.3	133.5	149.3	118.4	176.8	143.2
1985(r)	130.5	143.0	114.6	141.6	157.9	121.0	193.0	153.8
1986	133.1	148.9	115.3	146.4	161.9	120.7	204.3	160.3
1987	137.9	155.4	115.4	152.5	167.3	121.0	214.0	167.0

r - Revised.

Source: International Monetary Fund, "International Financial Statistics."

WHOLESALE PRICES
(1980 = 100)

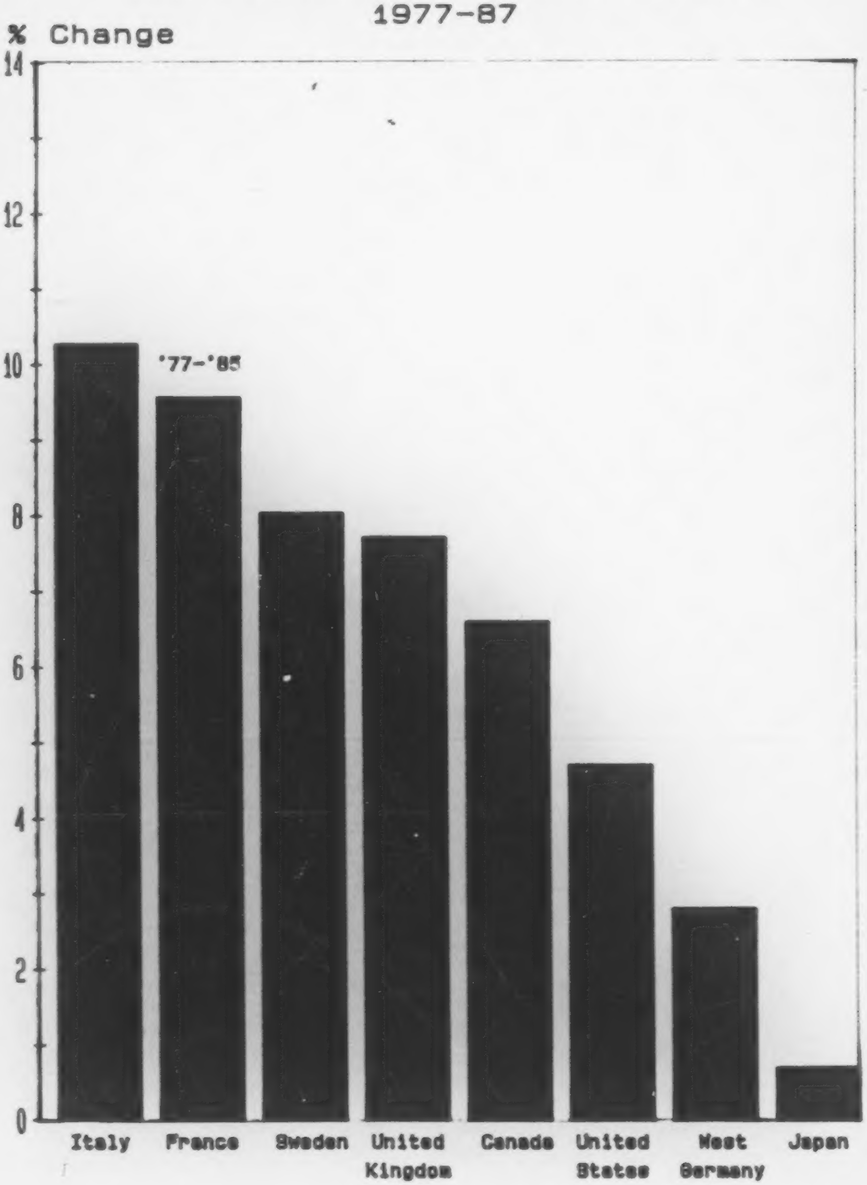
Year	United States	Canada(a)	Japan	United Kingdom(b)	France(c)	West Germany(d)	Italy	Sweden(e)
1966	37.2	35.9	44.5	22.7	39.6	57.8	21.4	NA
1967	37.2	36.6	45.3	24.4	39.3	57.3	21.4	NA
1968	38.2	37.3	45.7	25.2	38.6	56.9	21.5	35.0
1969	39.7	38.7	46.7	26.2	42.8	57.9	22.3	36.0
1970	41.1	39.7	48.4	28.2	46.0	60.8	24.0	38.0
1971	42.4	40.4	48.0	30.6	46.9	63.4	24.8	39.0
1972	44.3	42.2	48.4	32.2	49.1	65.1	25.8	41.0
1973	50.1	47.0	56.0	34.6	56.3	69.4	30.2	46.0
1974	59.6	55.9	73.7	42.7	72.7	78.7	42.5	57.0
1975	65.1	62.2	75.9	52.1	68.6	82.3	46.1	61.0
1976	68.1	65.4	79.7	61.1	73.6	85.4	57.1	66.0
1977	72.3	70.5	81.2	72.0	77.7	87.7	66.5	73.0
1978	77.9	77.0	79.1	79.1	81.1	88.7	72.1	78.0
1979	87.6	88.1	84.9	87.7	91.9	93.0	83.3	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981(r)	109.1	110.1	101.4	109.6	111.0	107.8	117.4	111.0
1982	111.3	116.8	103.2	118.0	123.3	114.1	133.7	125.0
1983(r)	112.7	120.8	100.9	124.4	136.9	115.8	146.7	139.0
1984(r)	115.4	125.7	100.7	132.1	155.1	119.2	161.9	150.0
1985	114.9	129.1	99.5	139.4	161.3	121.9	173.8	158.0
1986(r)	111.5	130.2	90.4	145.7	NA	118.3	172.3	154.0
1987	114.5	133.5	87.0	151.3	NA	115.6	176.8	158.0

NA - Not Available. r - Revised.

(a) Industrial selling prices.
(b) Manufacturing output prices.
(c) Industrial goods prices.
(d) Industrial products prices.
(e) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics."

Wholesale Prices
Average Annual Percent Change
1977-87



UNIT VALUE OF EXPORTS
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1970	38.2	34.1	59.5	26.4	41.7	61.2	22.4	37.0
1971	39.4	34.4	60.7	27.9	44.1	63.5	23.6	39.0
1972	40.7	35.5	59.9	29.5	44.6	65.4	24.3	41.0
1973	47.4	40.5	63.6	33.2	49.0	68.4	28.8	45.0
1974	60.5	53.7	85.4	42.4	61.8	79.4	40.8	57.0
1975	67.6	59.5	87.4	51.9	65.2	86.2	45.3	66.0
1976	69.9	60.9	86.9	62.1	71.2	89.7	55.3	70.0
1977	72.4	64.8	87.1	72.1	78.2	85.9	65.9	74.0
1978	77.4	71.0	82.2	79.0	82.2	86.7	70.7	78.0
1979	88.1	86.0	89.8	87.5	90.2	91.3	82.8	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.2	106.3	103.0	108.8	113.0	106.3	122.3	109.0
1982(r)	110.4	107.3	108.4	116.6	129.0	110.9	141.0	122.0
1983(r)	111.6	107.4	101.1	126.0	142.0	112.4	151.5	136.0
1984(r)	113.1	112.3	101.0	136.0	158.8	116.3	166.0	146.0
1985(r)	112.2	114.2	100.2	143.0	166.3	120.8	179.4	151.0
1986(r)	113.3	110.3	84.8	137.0	NA	116.8	171.1	150.0
1987	115.3	NA	79.7	142.0	NA	113.7	172.9	NA

r - Revised. NA - Not Available.

Source: International Monetary Fund, "International Financial Statistics."

SOVIET UNION FOREIGN TRADE (a)
1968 to Date
(Millions of U.S. Dollars)

	Exports			Imports		
Year	Total	Communist Countries (b)	Non-communist Countries	Total	Communist Countries (b)	Non-communist Countries
1968	$10,634	$ 7,134	$ 3,500	$ 9,410	$ 6,367	$ 3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,918	10,398	4,788	14,388	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50,798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	68,477	36,424	32,052
1981	78,809	43,044	35,764	72,631	36,905	35,727
1982	86,940	46,985	39,955	77,644	42,415	35,229
1983	91,653	50,914	40,739	80,440	45,484	34,957
1984	91,492	51,790	39,702	80,352	47,010	33,342
1985	86,400	52,800	33,600	82,400	50,300	32,100
1986	97,046	64,995	32,051	88,873	59,425	29,448
1987	76,454	50,234	26,220	70,578	48,747	21,831

(a) Exports and imports are F.O.B.

(b) Up to 1980, the following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic. After 1980 the following are included in the category: Bulgaria, China, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Korea, Laos, Mongolian People's Republic, Vietnam, and Yugoslavia.

Source: U.S. Department of Commerce "Overseas Business Reports," and U.S. Department of State

WORLD TRADE (a,r)
(Billions of U.S. Dollars)

	1984		1985		1986		1987(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
World	$1,778	$1,861	$1,799	$1,891	$1,995	$2,057	$2,328	$2,396
Industrial Countries	1,215	1,310	1,257	1,358	1,463	1,526	1,714	1,801
United States(b)	218	341	213	362	217	387	250	424
Canada	90	78	91	81	90	85	97	92
Japan	170	136	177	130	211	128	231	151
United Kingdom	94	105	101	109	107	124	131	154
France	98	104	102	108	125	129	148	158
West Germany	172	153	184	158	243	191	294	228
Italy	75	85	77	88	98	99	116	125
Other industrial	299	308	312	321	372	383	445	467
Developing Countries	533	529	511	513	492	507	560	560
Africa	65	64	62	58	54	53	NA	NA
Asia	181	193	178	203	189	207	229	248
West Hemisphere	104	78	98	74	84	74	92	NA
Middle East	121	122	109	103	95	94	NA	NA

p - Preliminary. r - Revised. NA - Not Available.

(a) Import values are cost, insurance, and freight (c.i.f.) except for Communist countries', which are free on board (f.o.b.).

(b) Exports include Department of Defense shipments.

Source: International Monetary Fund, "International Financial Statistics."

U.S. TRADE WITH COMMUNIST COUNTRIES (a,c)
(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
	To Eastern Europe (b)	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1967	$ 135.0	$ 60.3	Z	$ 136.1	$ 41.2	$ 0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	64.9
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979	2,066.2	3,603.6	1,716.5	998.8	873.2	592.3
1980	2,339.8	1,509.7	3,749.0	982.0	452.9	1,058.3
1981	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3
1982	1,012.8	2,583.7	2,912.1	839.4	227.6	2,283.7
1983	887.8	2,002.9	2,173.1	1,011.5	347.1	2,244.1
1984	903.9	3,283.9	3,004.3	1,599.4	600.1	3,064.8
1985	792.0	2,423.0	3,855.7	1,671.0	441.0	4,224.2
1986	737.0	1,248.0	3,106.0	1,596.0	605.0	5,241.0
1987	717.0	1,480.0	3,497.0	1,647.0	470.0	6,911.0

Z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.

(b) Does not include Yugoslavia.

(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce; "Business America."

BALANCE OF TRADE AND PAYMENTS

1985 to Date

(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
1985(r)	−122.2	−116.4
1986(r)	−144.3	−141.5
1987(p)	−159.2	−160.7
Canada		
1985(r)	13.2	−.9
1986(r)	8.1	−6.7
1987(p)	8.8	−7.2
Japan		
1985(r)	56.0	49.2
1986(r)	92.8	85.8
1987(p)	96.5	86.7
United Kingdom		
1985(r)	−3.2	3.9
1986(r)	−12.4	0
1987(p)	−16.3	−3.3
France		
1985(r)	−5.3	0
1986(r)	−2.4	3.0
1987(p)	NA	NA
West Germany		
1985(r)	28.5	17.0
1986(r)	55.7	39.8
1987(p)	70.2	45.2
Italy		
1985(r)	−6.2	−3.5
1986(r)	4.5	2.8
1987(p)	NA	NA

p - Preliminary. r - revised. NA - Not Available.

(a) Balance of payments basis (exports f.o.b. less imports c.i.f.).
(b) Net exports of goods end services and unilateral transfers (OECD basis).
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.

Source: International Monetary Fund, "International Financial Statistics."

COMPENSATION FOR PRODUCTION WORKERS

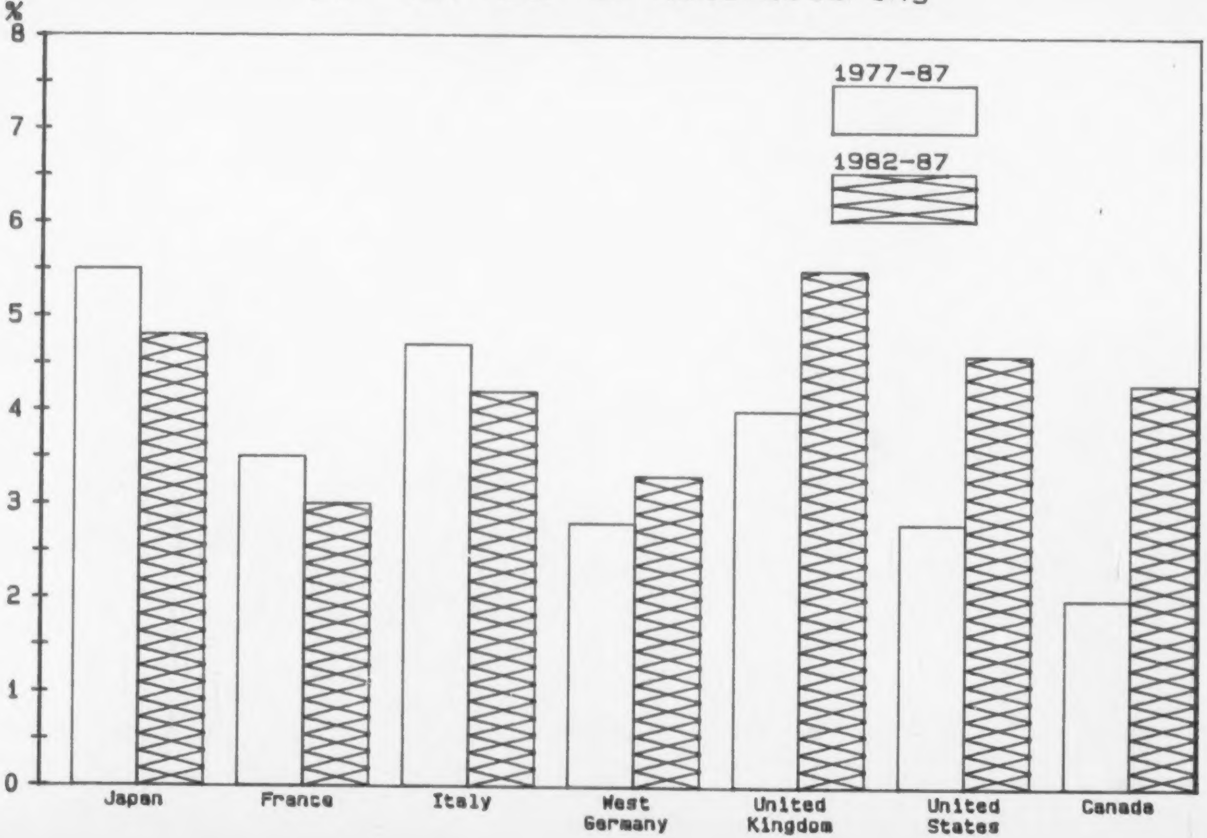
All Manufacturing, By Country, 1986 and 1987

(U.S. Dollars)

	Average Hourly Earnings(a)		Average Hourly Total Direct Pay(b)		Average Hourly Total Compensation(c)	
	1986	1987	1986	1987	1986	1987
United States	$9.73	$9.91	$10.53	$10.82	$13.21	$13.46
United Kingdom	5.53	6.67	6.36	7.69	7.50	9.07
France	5.65	6.72	7.26	8.64	10.27	12.36
West Germany	7.64	9.63	10.44	13.16	13.35	16.83
Switzerland	9.01	11.16	11.53	14.27	13.76	17.06
Italy	5.34	6.57	7.04	8.67	10.01	12.33
Sweden	7.34	8.89	8.73	10.57	12.43	15.14
Japan	5.63	6.74	8.28	9.92	9.40	11.34

(a) Pay for hours actually worked.
(b) Includes sick leave, holidays, vacation time, etc.
(c) Includes fringe benefits such as insurance, pension, etc.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons


Productivity
Average Annual Increase in Output per Man-Hour in Manufacturing

PRODUCTIVITY IN MANUFACTURING (r)

Selected Countries, 1969 to Date

Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1969	66.5	57.2	37.0	46.8	34.9	44.3	47.5
1970	71.0	64.5	39.1	46.7	42.9	50.6	53.7
1971	71.4	67.1	44.0	50.2	48.5	57.5	60.4
1972	72.1	70.0	52.9	56.9	55.1	64.5	67.7
1973	73.7	71.0	65.6	70.2	70.4	73.1	70.5
1974	84.1	81.8	76.8	74.3	79.1	77.6	79.3
1975	91.7	93.1	86.7	99.3	88.7	104.3	102.5
1976	94.9	102.7	86.9	96.1	87.3	90.5	92.2
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	106.6	99.3	126.8	117.9	121.0	115.6	126.4
1979	117.0	105.4	121.3	135.2	135.9	129.5	165.0
1980	130.6	121.5	116.8	156.4	147.9	141.4	220.7
1981	140.1	130.0	123.8	136.4	124.9	123.2	209.5
1982	148.7	146.3	108.8	124.9	119.7	119.9	186.9
1983	145.0	144.9	111.5	116.1	113.1	118.6	159.8
1984	142.2	130.3	107.2	107.6	102.6	107.6	142.8
1985	142.4	126.5	105.6	109.7	101.1	106.1	142.7
1986	141.8	129.5	154.2	145.8	140.8	139.2	169.2
1987	139.7	139.4	175.0	167.5	174.5	164.2	191.2
Hourly Compensation (a)							
1969	53.7	43.8	21.3	31.0	24.1	30.7	37.3
1970	57.4	48.8	25.3	32.7	30.5	36.8	43.2
1971	60.9	54.3	30.2	37.1	35.9	43.1	50.9
1972	64.2	59.4	39.8	44.5	43.4	52.3	60.2
1973	68.8	64.1	54.5	58.1	59.1	66.4	67.3
1974	76.2	75.0	66.4	63.7	69.1	73.9	77.0
1975	85.1	82.5	76.0	88.4	79.9	95.0	97.3
1976	92.1	97.3	81.9	91.8	84.2	89.5	91.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.2	100.3	137.0	123.4	124.8	119.1	128.3
1979	118.6	107.6	139.2	148.3	147.0	143.1	169.0
1980	132.4	119.3	143.2	172.9	160.7	165.3	224.8
1981	145.2	133.9	157.6	155.5	138.5	153.8	224.3
1982	157.5	143.8	146.9	152.4	134.8	155.4	212.0
1983	162.4	152.8	158.6	145.2	134.8	164.4	196.9
1984	168.0	152.1	163.5	139.1	126.9	159.1	185.6
1985	176.9	151.5	170.1	146.3	130.0	161.2	192.3
1986	182.7	154.7	252.7	198.6	184.1	213.1	234.3
1987	185.1	169.4	298.3	236.5	231.2	260.8	283.1
Output Per Man Hour (Productivity)							
1969	80.8	76.6	57.5	66.2	69.1	69.4	78.7
1970	80.8	75.6	64.8	70.0	71.2	72.7	80.4
1971	85.3	80.9	68.6	73.8	74.0	74.9	84.2
1972	89.0	84.9	75.3	78.2	78.9	81.1	88.9
1973	93.4	90.3	83.1	82.7	84.0	90.9	95.5
1974	90.6	91.7	86.5	85.8	87.4	95.3	97.1
1975	92.9	88.6	87.7	89.0	90.1	91.1	94.9
1976	97.1	94.8	94.3	95.6	96.5	98.9	99.1
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	101.5	101.1	108.0	104.6	103.1	103.0	101.5
1979	101.4	102.0	114.8	109.7	108.2	110.5	102.5
1980	101.4	98.2	122.7	110.6	108.6	116.9	101.9
1981	103.6	102.9	127.2	114.0	111.0	124.8	107.0
1982	105.9	98.3	135.0	122.0	112.6	129.6	113.5
1983	112.0	105.4	142.3	125.1	119.2	138.6	123.2
1984	118.1	116.8	152.5	129.3	123.7	147.8	130.0
1985	124.2	119.7	161.1	133.3	128.5	151.9	134.7
1986	128.8	119.4	163.8	136.2	130.7	153.1	138.5
1987	132.4	121.5	170.5	141.2	132.4	158.9	148.1

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

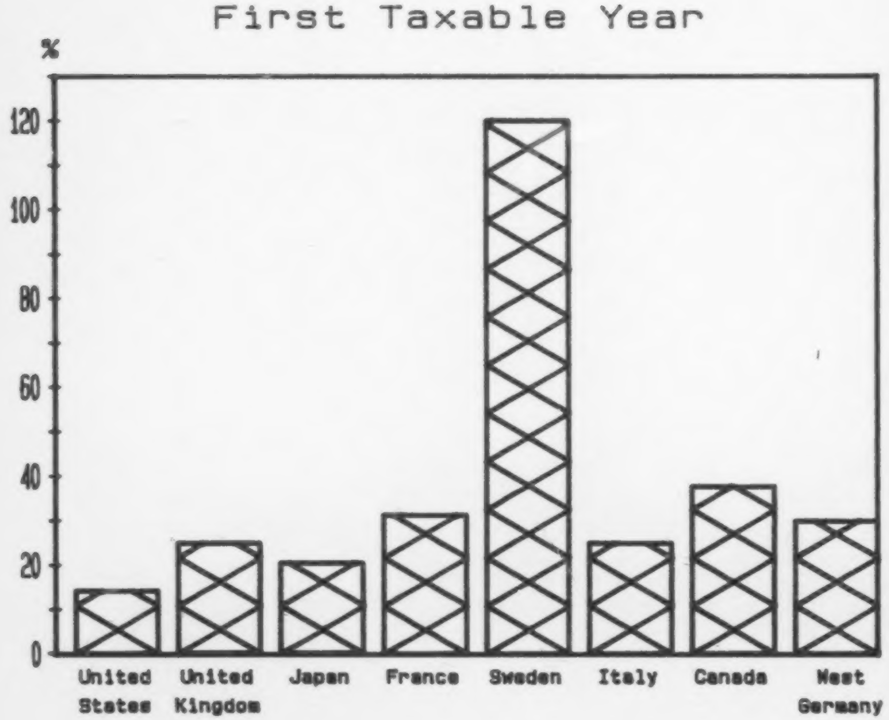
COST RECOVERY ALLOWABLE FOR TAX PURPOSES
ON MACHINERY AND EQUIPMENT, 1986
(Percent of Original Cost)

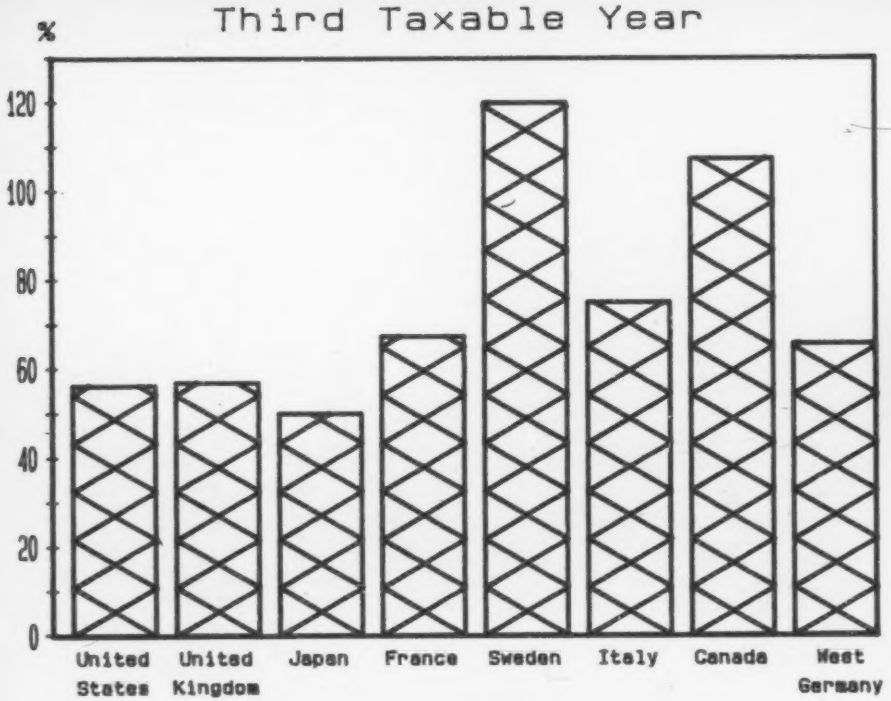
Country	Recovery Period (Years)	First Year	Third Year	Seventh Year
United States	7	14.3%	56.3%	95.5%
United Kingdom	11	25.0	57.0	86.7
Japan	10	20.6	50.0	80.1
France	8	31.3	67.4	94.9
Sweden	1	120.0	120.0	120.0
Italy	6	25.0	75.0	100.0
Belgium	7	33.0	61.8	102.0
Canada	3	37.7	107.4	107.4
Netherlands	8	44.4	69.4	119.4
West Germany	10	30.0	65.7	91.7
Australia	5	20.0	60.0	100.0

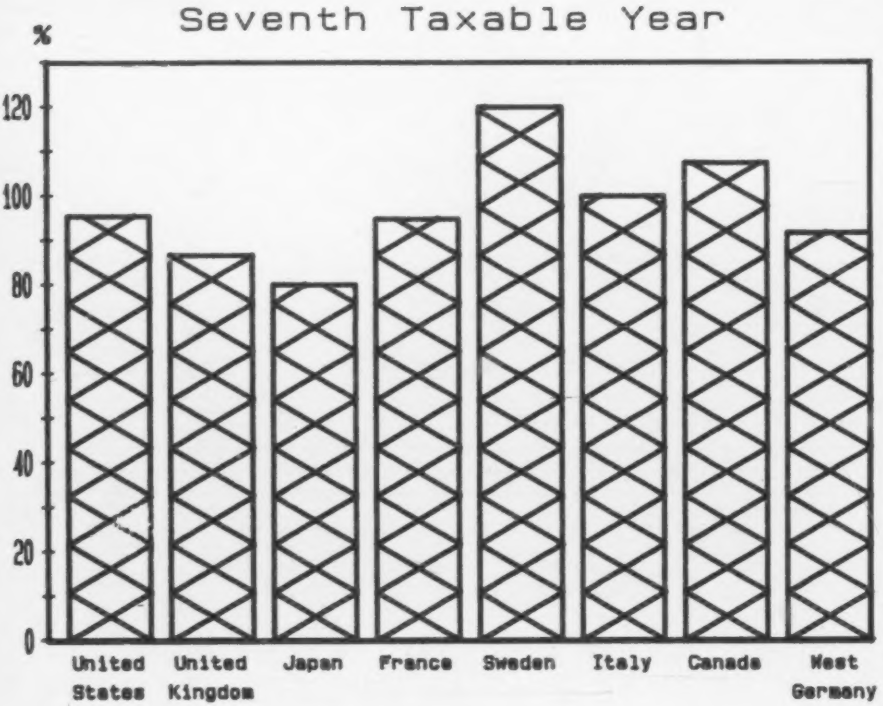
Note: These capital cost recovery allowances are based on current statutory or other published provisions of law. As such they do not reflect the informal or ad hoc arrangements that are frequently available in foreign countries to increase the rate of cost recovery actually allowed to industrial producers.

Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1986.

Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery can exceed 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country on a "typical" piece of capital equipment. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.




Third Taxable Year


Seventh Taxable Year

FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1985 (r)
Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (c)	Other (d)
Belgium	46.9%	10.7%	15.5%	3.0%	16.0%	1.7%
Canada	34.4	8.9	4.6	2.8	12.2	5.9
Denmark	51.3	16.9	2.0	2.5	25.8	4.2
France	44.5	12.8	19.4	1.9	5.7	4.8
Italy	41.2	9.7	14.3	3.8	11.0	2.3
Japan	30.7	3.7	9.3	6.5	7.6	3.6
Luxembourg	41.5	9.7	11.0	7.5	10.9	2.4
Netherlands	44.6	10.5	19.6	3.1	8.7	2.7
Sweden	51.9	13.2	12.9	1.8	20.0	4.1
Switzerland	30.3	5.3	9.7	1.8	10.5	2.9
Turkey	38.5	16.8	2.0	4.5	13.0	2.3
United Kingdom	37.6	11.2	6.6	4.9	9.8	5.2
United States	28.3	4.3	8.3	2.0	10.1	3.5
West Germany	37.7	9.2	13.8	2.3	10.8	1.6

r - revised.

(a) Includes general sales, value added, and specific excise taxes.
(b) Includes contributions of employers, employees, and self-employed.
(c) Includes income taxes on individual and unincorporated enterprise.
(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries," (Annual).

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1985 (r)
Selected Countries

Country	Total (a)	Employees	Employers	Self-Employed and Other
Belgium	15.5%	6.0%	8.3%	1.3%
Canada	4.6	1.6	2.9	0.1
Denmark	2.0	1.0	1.0	0.0
France	19.4	5.4	12.6	1.4
Italy	14.3	2.8	10.2	1.3
Japan	9.3	3.3	4.7	1.2
Luxembourg	11.0	4.3	5.7	1.0
Netherlands	19.6	8.5	7.8	3.3
Sweden	12.9	0.0	12.3	0.6
Switzerland	9.7	3.1	3.0	3.6
Turkey	2.0	0.5	1.4	0.0
United Kingdom	6.6	3.0	3.3	0.2
United States	8.3	3.2	4.9	0.3
West Germany	13.8	6.0	7.1	0.7

r - revised.

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund, workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries," (Annual).

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products." For the metal cutting industry this specialization ratio was 91% for 1982. This means that 91% of the products shipped by this industry were metal cutting machine tools and 9% were products other than metal cutting machine tools. For metal forming, the corresponding figures are 89% and 11%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio." In 1982, the coverage ratio in metal cutting was 93%, in metal forming 87%. This means that the metal cutting industry produced 93% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The Bureau of the Census adds additional digits to define products, e.g., a fifth to define product classes and sixth and seventh digits to specify individual products. Below is an illustration for machine tools:

Industries	Major Group 35:	Machinery, Except Electrical
	Group 354:	Metalworking Machinery, and Equipment
	Industry 3541:	Machine Tools, Metal Cutting Types
Products	Product Class 35413:	Gear Cutting Machines
	Product 3541371:	Gear Tooth Finishing Machines

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry. If all of the machine tool industry were combined into one firm, its sales would rank 151st on the 1987 "Fortune 500" listing of America's largest manufacturing companies.

While the most recent Census of Manufacturers (1982) reports almost 1,400 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1982 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York, and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufacturers (which takes place every five years) and the Annual Survey of Manufacturers. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Much of the data published for smaller firms is actually not the product of either the Census or the Annual Surveys. Instead, most of the data for firms with fewer than twenty employees is estimated from administrative records on payroll and sales supplied to the Census Bureau by other government agencies. It is often the case that over ninety percent of the data on small firms is the product of these administrative record based estimates.

A second problem with the Census is that it is published with a considerable time lag. Because 1982 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1985 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufacturers is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1958 to Date

	Establishments			Value Added by Manufacture	Cost of Materials	Value of Shipments
Year	Total	With 20 or More Employees	Employees (Number)	(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	936.8	513.7	1,430.3
1963	1,167	415	83,136	980.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	678.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	981.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.6	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972	1,277	437	76,600	1,319.4	821.6	2,114.4
1973	NA	NA	86,900	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,000	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977	1,343	469	83,100	2,588.0	1,491.7	3,943.3
1978	NA	NA	89,500	3,108.3	1,994.1	4,977.8
1979	NA	NA	96,100	3,837.8	2,423.9	6,052.5
1980	NA	NA	99,700	4,391.3	2,744.6	6,980.7
1981	NA	NA	98,300	4,716.4	2,850.0	7,481.0
1982	1,392	455	77,800	3,294.0	2,172.9	5,840.2
1983	NA	NA	58,300	2,242.3	1,554.9	4,023.2
1984	NA	NA	58,500	2,595.9	1,904.9	4,520.3
1985	NA	NA	60,500	2,933.2	2,070.3	4,789.8
1986	NA	NA	55,200	2,589.5	2,251.2	4,964.0

NA - Not available.

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufacturers, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufacturers."

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1967 to Date
Metal Cutting and Metal Forming

	Establishment			Value Added by Manufacture	Cost of Materials	Value of Shipments
Year	Total	With 20 or More Employees	Employees (Number)	(Millions of Dollars)		
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1967	903	338	87,200	$1,391.3	$ 766.9	$2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977	917	306	59,400	1,866.1	1,047.7	2,812.7
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979	NA	NA	69,100	2,833.8	1,736.9	4,389.0
1980	NA	NA	72,800	3,349.2	2,026.1	5,227.6
1981	NA	NA	74,300	3,739.9	2,187.3	5,865.3
1982	940	293	58,300	2,516.2	1,598.3	4,411.5
1983	NA	NA	43,000	1,612.7	1,100.0	2,880.9
1984	NA	NA	42,400	1,820.0	1,369.5	3,211.6
1985	NA	NA	42,800	2,000.0	1,471.6	3,377.0
1986	NA	NA	38,600	1,823.8	1,538.0	3,456.1
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1967	350	168	29,200	$ 437.2	$ 295.4	$ 714.0
1968	NA	NA	27,900	453.3	270.0	718.2
1969	NA	NA	28,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972	383	162	24,100	417.7	285.3	695.3
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,366.0
1979	NA	NA	27,000	1,004.0	687.0	1,663.5
1980	NA	NA	26,900	1,042.1	718.5	1,753.1
1981	NA	NA	24,000	976.5	662.7	1,615.7
1982	452	162	19,500	777.8	574.6	1,428.7
1983	NA	NA	15,300	629.6	454.9	1,142.3
1984	NA	NA	16,100	775.9	535.4	1,308.7
1985	NA	NA	17,700	933.2	598.7	1,412.8
1986	NA	NA	16,600	765.7	713.2	1,507.9

NA - Not Available.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufacturers, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufacturers."

LOCATION OF THE MACHINE TOOL INDUSTRY (c)

Establishments, Employees, Value Added, Shipments, By Region

For Selected Years, 1963 to 1982

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1963	1,167	415	83,136	$ 980	$1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
1982	1,392	455	77,600	3,332	5,869
NEW ENGLAND					
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	56(a)	D
1982(d)	166	53	14,590E	D	D
MIDDLE ATLANTIC					
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
1982(d)	178	53	12,100E	280(b)	424(b)
EAST NORTH CENTRAL					
1963	545	239	49,415	592	926
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
1982(d)	565	228	39,200E	D	D
WEST NORTH CENTRAL					
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
1982(d)	104	37	6,810E	D	D
SOUTH					
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
1982(d)	71	22	1,630E	D	D
WEST					
1963	130	28	3,016	35	55
1967	160	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)
1982(d)	165	32	2,910E	57(b)	100(b)

D - Withheld to avoid disclosure. E - Estimate.

(a) Includes metal forming data only, metal cutting data withheld to avoid disclosure.
(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.
(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.
(d) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)

General Statistics by Region
For Selected Years, 1963 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. TOTAL					
1963	801	269	61,058	$ 699	$1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	919	307	59,500	1,871	2,819
1982	940	293	58,100	2,555	4,440
NEW ENGLAND					
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
1982(b)	129	42	13,680E	D	D
MIDDLE ATLANTIC					
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
1982(b)	103	30	7,400	280	424
EAST NORTH CENTRAL					
1963	387	161	36,845E	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
1982(b)	397	156	28,300E	D	D
WEST NORTH CENTRAL					
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
1982(b)	83	28	5,710E	D	D
SOUTH					
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
1982(b)	63	17	1,410E	D	D
WEST					
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96
1982(b)	111	14	1,600	57	100

D - Withheld to avoid disclosure.   E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
For Selected Years, 1963 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. Total					
1963	366	146	22,078	$ 281	$ 441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
1982	452	162	19,500	778	1,429
NEW ENGLAND					
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	56	D
1982(b)	37	11	910E	D	D
MIDDLE ATLANTIC					
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
1982(b)	75	23	4,700E	D	D
EAST NORTH CENTRAL					
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
1982(b)	168	72	10,900E	D	D
WEST NORTH CENTRAL					
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
1982(b)	21	9	1,100E	D	D
SOUTH					
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
1982(b)	8	5	220E	D	D
WEST					
1963	40	14	1,772	20	31
1967	51	19	1,900	29	43
1972	47	15	2,000	39	64
1977	58	22	1,300E	D	D
1982(b)	54	18	1,300E	D	D

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Region
1977 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,200	358	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	180
STATE			1982(d)		
California	93	12	1,400	$ 50	$ 88
Connecticut	61	17	5,100	180	326
Florida	20	2	200	5	9
Illinois	90	30	5,400	208	358
Indiana	22	4	1,300	36	83
Iowa	4	2	(b)	D	D
Kansas	7	2	(b)	D	D
Kentucky	7	4	(b)	D	D
Maine	6	2	(b)	D	D
Massachusetts	35	11	2,600	114	176
Michigan	203	83	8,900	491	1,056
Minnesota	24	6	1,200	49	73
Missouri	7	1	200	3	8
New Hampshire	5	3	(c)	D	D
New Jersey	27	4	400	17	28
New York	42	14	4,900	176	275
North Carolina	8	4	200	8	22
Ohio	75	35	12,300	547	934
Pennsylvania	34	12	2,100	86	121
Rhode Island	16	5	(c)	D	D
South Carolina	5	2	(a)	D	D
South Dakota	3	2	(a)	D	D
Tennessee	3	1	(a)	D	D
Texas	22	6	(b)	D	D
Vermont	6	4	2,600	91	153
Virginia	5	2	(b)	D	D
Washington	18	2	200	7	12
Wisconsin	38	15	3,400	255	375

D – Withheld to avoid disclosure.

(a) 150 – 249 Employees.
(b) 250 – 499 Employees.
(c) 1,000 – 2,499 Employees.
(d) Data includes only states with 150 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY

General Statistics by Region

1977 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New York	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Pennsylvania	19	7	900	37	59
Texas	10	4	200	4	6
STATE			1982(d)		
California	42	13	1,000	$ 38	$ 79
Colorado	6	3	(a)	D	D
Connecticut	24	9	800	28	48
Illinois	56	25	4,400	232	397
Indiana	10	7	(b)	D	D
Kansas	5	3	300	10	19
Massachusetts	13	2	(a)	D	D
Michigan	55	22	1,600	67	117
Minnesota	5	2	(b)	D	D
Missouri	11	4	300	9	15
New Jersey	20	4	(b)	D	D
New York	31	9	1,700	49	91
North Carolina	4	3	(a)	D	D
Ohio	47	18	4,400	173	329
Pennsylvania	24	10	(c)	D	D
Virginia	4	2	(a)	D	D
Washington	6	2	200	8	12

D – Withheld to avoid disclosure.

(a) 150 – 249 Employees.
(b) 250 – 499 Employees.
(c) 1,000 – 2,499 Employees.
(d) Machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82 – 1 – 35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	1,146	1,209	1,232	1,285	1,290
Number of Establishments	1,167	1,253	1,277	1,345	1,392
Number of Employees	83,136	116,400	76,600	83,100	77,600(e)
1 to 4 Employees					
Establishments	375	336	380	434	433
Employees	714	500	800	800	900
5 to 9 Employees					
Establishments	191	189	212	262	279
Employees	1,295	1,300	1,500	1,700	1,900
10 to 19 Employees					
Establishments	186	222	248	178	225
Employees	2,612	3,100	3,400	2,400	3,000
20 to 49 Employees					
Establishments	182	218	194	219	202
Employees	5,643	6,500	6,000	6,700	6,200
50 to 99 Employees					
Establishments	96	111	89	98	110
Employees	6,455	7,700	6,200	6,700	7,600
100 to 249 Employees					
Establishments	67	79	83	75	75
Employees	10,620	12,700	12,500	11,500	11,900
250 to 499 Employees					
Establishments	31	43	37	41	29
Employees	11,249	15,100	12,600	14,800	9,700
500 to 999 Employees					
Establishments	22	30	24	27	31
Employees	15,583	21,400	17,600	21,700(a)	22,100(a)
1000 to 2499 Employees					
Establishments	22	8	8	7	14
Employees	19,236	35,500	16,200(b)	16,600(b,d)	14,200(b,d)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(c)	(c)	(c)
Covered by Administrative Records (f)					
Establishments	NA	330	355	673	740
Employees	NA	700	900	3,200	3,800

NA – Not Available.

(a) Also includes data for the "1000 to 2499 Employees" (metal forming only) category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000-2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting only) category.
(e) Due to estimating procedures by the Census department, individual items may not add to total.
(f) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	784	865	857	874	860
Number of Establishments	801	903	894	919	940
Number of Employees	61,058	87,200	52,500	59,400	58,100
1 to 4 Employees					
Establishments	276	256	281	315	295
Employees	529	400	600	600	600
5 to 9 Employees					
Establishments	127	142	158	184	202
Employees	840	1,000	1,100	1,200	1,400
10 to 19 Employees					
Establishments	129	167	180	112	150
Employees	1,803	2,300	2,500	1,500	2,000
20 to 49 Employees					
Establishments	118	145	126	144	122
Employees	3,607	4,300	3,900	4,400	3,800
50 to 99 Employees					
Establishments	56	74	55	67	73
Employees	3,727	5,200	3,800	4,600	4,900
100 to 249 Employees					
Establishments	44	49	47	40	45
Employees	6,912	8,100	7,000	6,300	7,000
250 to 499 Employees					
Establishments	22	30	24	28	22
Employees	7,713	10,600	8,400	10,300	7,500
500 to 999 Employees					
Establishments	15	20	14	19	24
Employees	10,664	13,900	9,200	13,800	16,700
1000 to 2499 Employees					
Establishments	11	17	7	7	6
Employees	15,534	28,900	16,200(a)	16,600(a)	14,200(a)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(b)	(b)	(b)
Covered by Administrative Records (c)					
Establishments	NA	245	265	455	545
Employees	NA	500	700	1,800	2,900

NA - Not Available.

(a) Also includes data for the "2500 Employees or More" category.
(b) The number of employees is included in the "1000-2499 Employees" category.
(c) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years, 1963 to 1982

	1963	1967	1972	1977	1982
Number of Companies	362	344	375	411	430
Number of Establishments	366	350	383	426	452
Number of Employees	22,078	29,200	24,100	23,700	19,500
1 to 4 Employees					
Establishments	99	80	99	119	138
Employees	185	100	200	200	300
5 to 9 Employees					
Establishments	64	47	54	78	77
Employees	455	300	400	500	500
10 to 19 Employees					
Establishments	57	55	68	66	75
Employees	809	800	900	900	1,000
20 to 49 Employees					
Establishments	64	73	68	75	80
Employees	2,036	2,200	2,100	2,300	2,400
50 to 99 Employees					
Establishments	40	37	34	31	37
Employees	2,728	2,500	2,400	2,100	2,700
100 to 249 Employees					
Establishments	23	30	36	35	30
Employees	3,708	4,600	5,500	5,200	4,900
250 to 499 Employees					
Establishments	9	13	13	13	7
Employees	3,536	4,500	4,200	4,500	2,200
500 to 999 Employees					
Establishments	7	10	10	8	7
Employees	4,919	7,500	8,400(a)	7,900(a)	5,400(a)
1000 to 2499 Employees					
Establishments	3	5	1	1	1
Employees	3,702	6,600	(c)	(c)	(c)
2500 Employees or More					
Establishments	—	—	—	—	—
Employees	—	—	—	—	—
Covered by Administrative Records (d)					
Establishments	NA	85	90	218	195
Employees	NA	200	200	1,400	900

NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Due to estimating procedures by the Census department, individual items may not add to total.
(c) The number of employees is included in the "500-999 Employees" category.
(d) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY

End of Year, Selected Years, 1973 to Date

(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1973	$ 885.7	$ 591.9	$293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979	1,689.2	1,242.2	447.0
1980	1,874.6	1,419.4	455.2
1981	2,359.1	1,764.9	594.2
1982	1,943.1	1,431.6	511.5
1983	1,642.9	1,219.4	423.5
1984	1,690.6	1,237.4	453.2
Finished Products			
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979	312.1	222.3	89.8
1980	354.1	253.5	100.6
1981	507.1	343.6	163.5
1982	501.0	355.6	145.4
1983	441.5	310.2	131.3
1984	404.0	282.2	121.8
Work in Process			
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979	1,042.8	812.5	230.3
1980	1,220.3	989.4	230.9
1981	1,413.2	1,117.4	295.8
1982	1,047.1	809.5	237.6
1983	863.8	669.7	194.1
1984	928.1	705.5	222.6
Materials, Supplies, Fuel, Etc.			
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979	334.3	207.4	126.9
1980	300.0	176.4	123.6
1981	438.7	303.8	134.9
1982	395.0	266.5	128.5
1983	337.3	239.5	97.8
1984	358.5	249.7	108.8

[*] Beginning in 1983, a uniform reporting method was introduced based on cost or market valuations of inventories. This change replaces the numerous accounting methodologies accepted in the past.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES
Selected Years, 1967 to 1982
(Values in Millions of Dollars)

Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1967	$2,127.2	$1,715.7	$269.7	$141.8	86%
1972	1,418.1	1,135.5	188.9	93.7	86
1977	2,812.7	2,353.9	337.0	121.8	87
1982	4,440.2	3,877.2	369.5	193.6	91
Metal Forming Industry (3542)	**TOTAL SHIPMENTS**	**Metal Forming Machine Tools**	**Secondary Products**	**Miscellaneous Receipts**	**% Primary Product Specialization**
1967	$ 714.0	$ 568.4	$ 99.5	$ 46.1	85%
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90
1982	1,428.7	1,210.5	143.6	74.6	89

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982; Industry Series: Metalworking Machinery and Equipment MC82-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
Quantity Used

Material	Unit of Measure	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Cutting Industry 1982	Metal Forming Industry 1972	Metal Forming Industry 1977	Metal Forming Industry 1982
MILL SHAPES							
Carbon Steel	Short Ton	85,900(i)	NA	NA	139,100(j)	113,400(a)	52,500(q)
Stainless Steel	Short Ton	900	NA	NA	500	100(m)	NA
Other Alloy Steel	Short Ton	24,500	20,000(o)	NA	9,600	12,000(n)	NA
Copper and Alloy	000 Lbs.	600(h,k)	3,800(d,h)	NA	300(k)	800(k)	NA
Aluminum and Alloy	000 Lbs.	1,400(b)	NA	NA	NA	1,100	NA
Iron and Steel Scrap	Short Ton	20,100	6,500	NA	D	NA	D
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	69,900	77,900(p)	7,300(r)	36,500	NA	D
Steel	Short Ton	NA	NA	D	11,100	12,400(p)	D
Aluminum and Alloy	000 Lbs.	NA	NA	D	700	2,600(p)	0
Copper and Alloy	000 Lbs.	1,100	1,700(p)	0	2,600	NA	0
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	4,700	5,900(p)	NA	7,500	8,200(p)	NA
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	96,300(c)	1,900(l,p)	D	900(1)	1,900(1,p)	0
Integral	Number	NA	NA	900(r)	NA	NA	D

NA - Not Available. D - Withheld to avoid disclosure.

- (a) Excludes structural shapes and all other carbon steel.
- (b) Sheet and extrusion only.
- (c) Excludes timing motors.
- (d) Insulated wire and cable only.
- (e) Excludes wire and wire products and sheet and strip.
- (f) Excludes plate, sheet and strip and pipe and tube.
- (g) Sheet and plate only.
- (h) Bare wire only.
- (i) Bars and bar shapes, sheet and strip, and plates only.
- (j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
- (k) Rod, bar, and mechanical wire and plate, sheet, and strip only.
- (l) Timing motors only.
- (m) Sheet and strip only.
- (n) Excludes bars and bar shapes.
- (o) Bars and bar shapes only.
- (p) Purchased only.
- (q) Plates only.
- (r) Produced & Consumed only, no Purchases.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

SELECTED MATERIALS CONSUMED

By the Machine Tool Industry, Selected Years

(Millions of Dollars)

	Metal Cutting Industry			Metal Forming Industry		
Material	1972	1977	1982	1972	1977	1982
GRAND TOTAL	$ 454.3	$ 904.4	$1,380.0	$ 253.4	$ 395.7	$512.8
MILL SHAPES						
Carbon Steel	34.4	63.1	69.6	36.7	58.3	58.0
Stainless Steel	3.2	3.0	1.6	.6	.7	.8
Other Alloy Steel	15.5	23.2	18.8	7.0	12.1	7.5
Copper and Alloy	3.5	5.5	8.2	1.1(a)	2.4(c)	19.0
Aluminum and Alloy	1.4	1.7	3.4	0.8	2.7	.5(b)
Iron and Steel Scrap	.9	1.1	2.3	D	.7	.3
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	43.6	84.5	88.0	18.1	29.4	27.0
Steel	4.4	8.7	54.6	8.9	18.8	16.6
Aluminum and Alloy	4.1	6.0	3.0	.8	2.9	2.4
Copper and Alloy	1.2	2.5	1.2	2.9	1.5	2.9
IRON AND STEEL FORGINGS						
Iron and Steel Forgings	4.3	8.7	15.4	6.1	11.3	13.8
ELECTRICAL MOTORS AND GENERATORS						
Fractional	4.3	7.0	26.8	.6	2.7	5.1
Integral	16.3	26.3	35.1	6.6	12.6	6.7
BEARINGS						
Ball and Roller	13.2	18.6	25.9	3.7	7.6	9.5
ALL OTHER MATERIALS						
Components, Parts, Etc.	227.0	478.6	753.6	114.7	151.7	174.3
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	77.0	165.9	272.5	44.8	80.3	166.9

D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.
(b) Sheet, plate and foil only.
(c) Excludes plate, sheet and strip.

Source: U.S. Bureau of the Census "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

4

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix;" the share of the total comprised by the different major machine tool product categories.

One of the more notable of these changes is the increased share of "other machines" in metal cutting machine tool shipments. This category's share of output has risen from 15-20% in the late 1950's and early 1960's to more than twice that level in recent years. The reason for this dramatic rise is that this group includes station type machines and multi-function NC machines (machining centers). As such, its increased market share demonstrates parallel yet divergent trends ongoing in American metalworking.

Station type machines are highly specialized, dedicated machines, designed to produce one part in volumes of up to hundreds of thousands per year. They are the model of efficiency through the use of dedicated mass production. Machining centers, on the other hand, represent efficiency through flexibility. By virtue of their tool changing capability and their numerical control - in which a part-making program maintains the production process rather than manual control - these machines can be easily reprogrammed to produce a variety of parts.

These are only two examples of how machine tool technology and America's machine tool builders have responded to the changing metalworking needs of America's manufacturers.

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: most of the major categories of metal cutting machine tools (boring, drilling, gear cutting, presses, etc.), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind. Broad coverage is given to both metal cutting and metal forming machine tools in these reports.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1982 Census of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ-35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than either the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than the Census or Annual Survey.

NMTBA Estimate of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The figures received each month from respondents are expanded, based on "benchmark" totals derived from the MQ-35W reports, to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped, by 5- and 7-digit SIC categories, for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA "Industry Estimate."

The MQ-35W report also provides data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products, including those who produce machine tools for their own use but not for sale in the marketplace, and thus to cover all shipments.

SHIPMENTS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	133	900	803	97	343	307	36
1958	591	507	84	438	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	164	541	420	121	203	160	43
1961	751	522	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	205	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	158	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167
1982	3,604	3,198	406	2,895	2,599	296	710	600	110
1983	1,845	1,630	215	1,372	1,200	172	474	430	43
1984	2,286	2,093	193	1,607	1,484	123	679	609	71
1985	2,545	2,291	254	1,742	1,549	194	803	743	60
1986	2,579	2,306	272	1,890	1,685	206	688	621	67
1987	2,324	2,037	287	1,677	1,499	178	647	538	109

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	$101	$ 315	$290	$ 25
1957	722	644	78	552	491	61	170	153	17
1958	427	350	77	299	247	52	126	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	29
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974	2,583	2,185	398	2,017	1,716	301	566	470	96
1975	1,277	1,064	213	916	781	135	361	284	77
1976	2,203	1,961	242	1,662	1,477	185	541	485	56
1977	2,995	2,709	286	2,202	1,981	221	793	729	64
1978	4,349	3,944	405	3,375	3,043	332	973	901	72
1979	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980	4,754	4,239	515	3,885	3,496	389	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100
1982	1,498	1,261	236	1,064	890	175	433	372	62
1983	1,696	1,558	138	1,152	1,069	82	545	489	56
1984	2,916	2,631	285	1,916	1,700	216	1,000	932	69
1985	2,528	2,262	266	1,853	1,652	201	675	610	65
1986	2,125	1,883	242	1,544	1,377	168	581	507	74
1987	2,119	1,831	288	1,451	1,294	157	667	536	131

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1961 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1961	$ 808	$ 36	$ 772	$ 621	$ 30	$ 591	$ 187	$ 6	$ 181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	1,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1,474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1,332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974	2,970	387	2,583	2.283	266	2,017	687	121	566
1975	1,651	374	1,277	1,198	282	916	453	92	361
1976	2,370	167	2,203	1,793	131	1,662	578	37	541
1977	3,153	158	2,995	2,329	127	2,202	824	31	793
1978	4,573	224	4,349	3,559	184	3,375	1,013	40	973
1979	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717
1982	1,934	437	1,498	1,467	402	1,064	468	34	433
1983	1,890	194	1,696	1,328	177	1,152	561	17	545
1984	3,044	128	2,916	2,005	90	1,916	1,038	38	1,000
1985	2,716	188	2,528	1,983	130	1,853	733	58	675
1986	2,322	197	2,125	1,675	131	1,544	647	66	581
1987	2,253	134	2,119	1,533	82	1,451	719	52	667

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

UNFILLED ORDERS

Metal Cutting and Metal Forming Machine Tools, 1962 to Date

(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1962	$ 463	$ 354	$109	1975	$1,450	$1,062	$388
1963	628	475	153	1976	1,594	1,243	351
1964	1,043	669	374	1977	2,308	1,794	515
1965	1,311	899	412	1978	3,643	2,981	663
1966	1,701	1,307	394	1979	5,388	4,546	843
1967	1,317	1,089	228	1980	5,451	4,750	701
1968	1,064	810	412	1981	3,300	2,873	427
1969	1,195	812	394	1982	1,194	1,043	151
1970	706	471	228	1983	1,045	823	222
1971	569	408	162	1984	1,675	1,132	542
1972	963	702	621	1985	1,658	1,243	414
1973	2,074	1,454	621	1986	1,204	897	307
1974	2,625	2,025	600	1987	1,000	672	327

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	337	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282
1982	1,467	402	1,064	1,262	373	890	204	30	175
1983	1,328	177	1,152	1,236	167	1,069	92	10	82
1984	2,005	90	1,916	1,780	80	1,700	226	9	216
1985	1,983	130	1,853	1,769	117	1,652	213	13	201
1986	1,675	131	1,544	1,499	122	1,377	176	9	168
1987	1,533	82	1,451	1,366	71	1,294	167	10	157

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

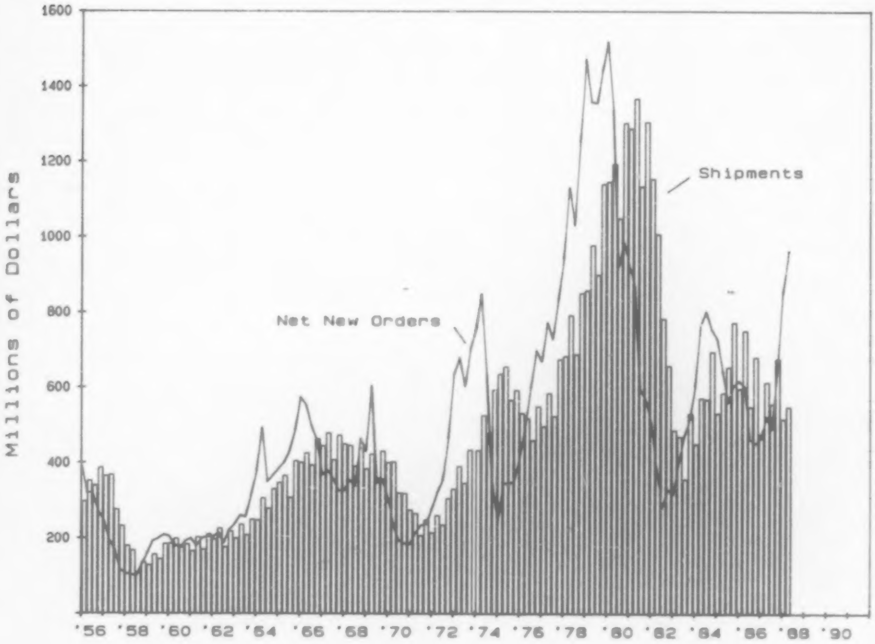
Domestic & Foreign, 1956 to Date

(Millions of Dollars)

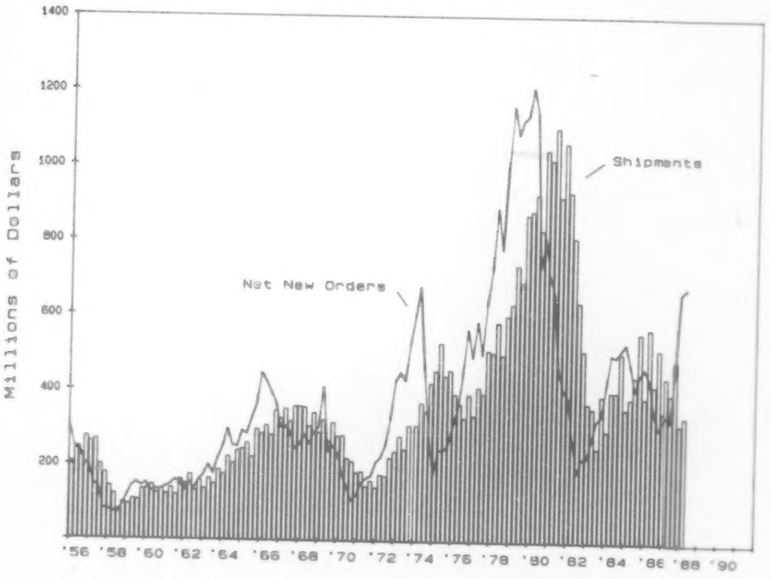
	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$ 340	$ 25	$ 315	$ 314	$ 24	$290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	278	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974	687	121	566	583	113	470	105	8	96
1975	453	92	361	364	81	284	89	12	77
1976	578	37	541	513	28	485	64	8	56
1977	824	31	793	757	29	729	67	2	64
1978	1,013	40	973	938	37	901	75	3	72
1979	1,190	64	1,126	1,048	57	991	142	7	136
1980	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100
1982	468	34	433	399	28	372	68	7	62
1983	561	17	545	503	14	489	58	2	56
1984	1,038	38	1,000	967	36	932	71	3	69
1985	733	58	675	664	54	610	69	4	65
1986	647	66	581	567	60	507	81	7	74
1987	719	52	667	583	47	536	136	5	131

Individual items may not add to totals due to rounding.

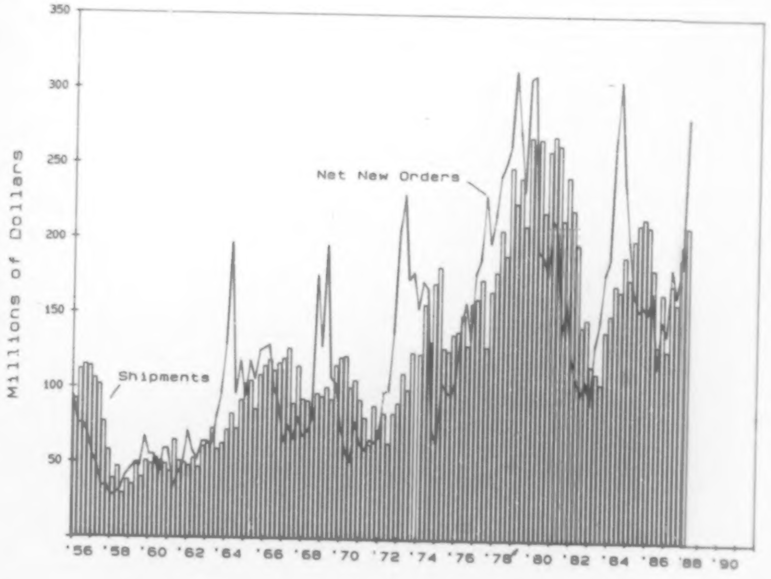
Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).


Total Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956:1 to 1988:2

Metal Cutting Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1988: 2



Metal Forming Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1988: 2



SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1956-1963

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 274,100	$ 23,750	$187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,800	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$1,270,300	$107,000	$858,200	$ 87,000	$412,100	$20,000
1957-1 qtr.	$ 331,900	$ 33,350	$232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$1,110,350	$132,350	$803,550	$ 96,600	$306,800	$35,750
1958-1 qtr.	$ 160,050	$ 19,900	$125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$381,100	$ 57,300	$126,050	$26,750
1959-1 qtr.	$ 108,200	$ 20,750	$ 79,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$389,850	$ 50,750	$148,450	$26,950
1960-1 qtr.	$ 159,550	$ 25,950	$117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$163,150	$420,750	$120,750	$160,100	$42,400
1961-1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$228,250	$366,550	$174,700	$156,100	$53,550
1962-1 qtr.	$ 140,250	$ 57,700	$106,100	$ 43,900	$ 34,150	$13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$215,200	$450,050	$162,800	$156,000	$52,400
1963-1 qtr.	$ 163,100	$ 36,850	$112,600	$ 24,650	$ 50,500	$12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	150,450	36,700	51,400	11,300
Total	$ 741,250	$154,500	$526,050	$112,400	$215,200	$42,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1964-1971
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1964-1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$10,150
2	259,800	46,700	183,550	39,850	76,250	6,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$204,600	$ 679,150	$165,500	$280,600	$39,100
1965-1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$1,248,800	$176,800	$ 885,850	$136,700	$362,950	$40,100
1966-1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$1,534,350	$150,850	$1,097,500	$124,250	$436,850	$26,600
1967-1 qtr.	$ 399,500	$ 41,050	$ 289,750	$ 35,900	$109,750	$10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$1,617,950	$188,000	$1,211,050	$142,150	$406,900	$45,850
1968-1 qtr.	$ 402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$1,562,750	$164,150	$1,238,300	$120,000	$324,450	$44,150
1969-1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$1,446,750	$150,800	$1,077,450	$115,000	$369,300	$35,800
1970-1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$110,450	$10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$1,238,950	$204,100	$ 827,350	$165,550	$411,600	$38,550
1971-1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209,950	38,800	136,800	23,450	73,150	15,350
Total	$ 839,800	$158,100	$ 554,200	$118,100	$285,600	$40,000

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1972-1979
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1972-1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58,000	5,850
4	271,750	34,700	198,300	24,150	73,450	10,550
Total	$ 894,350	$124,350	$ 627,150	$ 87,300	$267,200	$ 37,050
1973-1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$1,323,100	$177,900	$ 935,050	$138,700	$388,050	$ 39,200
1974-1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$1,763,150	$267,400	$1,241,350	$204,500	$521,800	$ 62,900
1975-1 qtr.	$ 526,550	$109,700	$ 375,400	$ 78,400	$151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$2,032,600	$419,100	$1,548,100	$330,550	$484,500	$ 88,550
1976-1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 58,500	$112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$1,743,350	$316,300	$1,269,850	$212,250	$473,500	$104,050
1977-1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$136,250	$ 24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$2,030,200	$250,550	$1,469,850	$180,950	$560,350	$ 69,600
1978-1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$161,250	$ 18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$2,688,600	$324,850	$1,960,100	$228,400	$728,500	$ 96,450
1979-1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$205,300	$ 19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$3,465,300	$411,250	$2,605,500	$324,550	$859,800	$ 86,700

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1980 to Date
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1980-1 qtr.	$1,030,450	$115,700	$ 794,650	$ 86,750	$235,800	$ 28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$4,084,250	$607,500	$3,206,000	$474,800	$878,250	$132,700
1981-1 qtr.	$1,077,400	$210,800	$ 862,250	$155,600	$215,150	$ 55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$4,376,650	$718,950	$3,552,450	$552,050	$824,200	$166,900
1982-1 qtr.	$1,041,550	$112,650	$ 861,300	$ 71,750	$180,250	$ 40,900
2	911,850	96,600	735,300	75,350	176,550	21,250
3	676,200	107,200	550,700	89,750	125,500	17,450
4	568,750	89,600	451,300	59,300	117,450	30,300
Total	$3,198,350	$406,050	$2,598,600	$296,150	$599,750	$109,900
1983-1 qtr.	$ 430,800	$ 56,650	$ 329,800	$ 40,800	$101,000	$ 15,850
2	411,350	58,300	308,200	49,300	103,150	9,000
3	314,150	42,900	220,150	32,200	94,000	10,700
4	473,750	57,150	341,450	49,600	132,300	7,550
Total	$1,630,050	$215,000	$1,199,600	$171,900	$430,450	$ 43,100
1984-1 qtr.	$ 408,950	$ 40,550	$ 273,000	$ 25,100	$135,950	$ 15,450
2	521,600	50,700	373,550	28,250	148,050	22,450
3	527,000	41,850	377,250	24,300	149,750	17,550
4	635,050	60,150	460,050	45,000	175,000	15,150
Total	$2,092,600	$193,250	$1,483,850	$122,650	$608,750	$ 70,600
1985-1 qtr.	$ 482,750	$ 48,950	$ 319,900	$ 37,150	$162,850	$ 11,800
2	548,350	37,700	357,550	27,450	190,800	10,250
3	596,400	58,250	407,100	35,950	189,300	22,300
4	663,950	108,850	463,950	93,200	200,000	15,650
Total	$2,291,450	$253,750	$1,548,500	$193,750	$742,950	$ 60,000
1986-1 qtr.	$ 529,800	$ 67,500	$ 331,750	$ 55,200	$198,050	$ 12,300
2	686,900	64,100	519,850	49,500	167,050	14,600
3	485,150	64,200	369,200	49,500	115,950	14,700
4	604,200	76,650	463,900	51,400	140,300	25,250
Total	$2,306,050	$272,450	$1,684,700	$205,600	$621,350	$ 66,850
1987-1 qtr.	$ 420,850	$ 55,950	$ 311,100	$ 38,050	$109,750	$ 17,900
2	542,800	71,300	396,300	46,300	146,500	25,000
3	490,350	66,300	354,400	43,350	135,950	22,950
4	582,750	93,350	437,050	49,950	145,700	43,400
Total	$2,036,750	$286,900	$1,498,850	$177,650	$537,900	$109,250

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipment and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1956-1963

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 353,700	$ 39,050	$265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222,550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$1,172,250	$126,600	$882,200	$101,300	$290,050	$25,300
1957-1 qtr.	$ 221,300	$ 25,500	$168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$491,950	$ 61,200	$153,550	$17,050
1958-1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$247,950	$ 51,550	$103,350	$25,900
1959-1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45,150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$105,800	$470,950	$ 70,850	$173,500	$34,950
1960-1 qtr.	$ 158,500	$ 44,750	$112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$217,300	$375,000	$160,300	$152,650	$57,000
1961-1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$237,800	$401,150	$190,650	$135,600	$47,150
1962-1 qtr.	$ 156,600	$ 42,300	$102,200	$ 26,200	$ 54,400	$16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 662,050	$154,550	$468,850	$103,250	$193,200	$51,300
1963-1 qtr.	$ 196,150	$ 39,000	$140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$191,950	$606,850	$152,900	$262,800	$39,050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1964-1971

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1964-1 qtr.	$ 312,150	$ 64,000	$ 194,200	$ 52,900	$117,950	$11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$1,348,050	$230,850	$ 861,250	$177,900	$486,800	$52,950
1965-1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$1,532,950	$160,450	$1,122,650	$129,050	$410,300	$31,400
1966-1 qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$116,050	$11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$1,884,450	$191,200	$1,483,100	$146,800	$401,350	$44,400
1967-1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,800
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$1,272,800	$148,800	$1,024,650	$110,300	$248,150	$38,500
1968-1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$1,320,450	$153,650	$ 959,900	$119,450	$360,550	$34,200
1969-1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$116,550	$11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$1,517,000	$211,750	$1,032,650	$162,650	$484,350	$49,100
1970-1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$179,200	$ 506,750	$144,550	$226,600	$34,650
1971-1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128.800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$113,850	$ 524,100	$ 84,650	$223,200	$29,200

Source: NMTBA,"Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1972-1979

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1972-1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$1,245,450	$166,550	$ 877,250	$131,700	$368,200	$ 34,850
1973-1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$188,000	$ 18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$2,267,600	$345,050	$1,550,400	$275,050	$717,200	$ 70,000
1974-1 qtr.	$ 644,500	$107,700	$ 509,750	$ 88,100	$134,750	$ 19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$2,185,250	$397,800	$1,715,650	$301,400	$469,600	$ 96,400
1975-1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$ 20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$1,064,050	$212,700	$ 780,500	$135,400	$283,550	$ 77,300
1976-1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$ 13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$1,961,450	$241,750	$1,476,600	$185,550	$484,850	$ 56,200
1977-1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$2,709,650	$285,700	$1,980,700	$221,350	$728,950	$ 64,350
1978-1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$3,944,100	$404,400	$3,043,150	$332,300	$900,950	$ 72,100
1979-1 qtr.	$1,322,800	$148,600	$1,031,550	$126,700	$291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$4,856,500	$764,950	$3,865,800	$629,300	$990,700	$135,650

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1980 to Date
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1980-1 qtr.	$1,331,950	$185,500	$1,057,900	$149,900	$274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$4,239,550	$514,750	$3,495,500	$389,250	$744,050	$125,500
1981-1 qtr.	$ 809,950	$110,400	$ 615,250	$ 91,350	$194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	23,050
Total	$2,562,650	$382,200	$1,945,800	$282,300	$616,850	$ 99,900
1982-1 qtr.	$ 432,300	$ 74,500	$ 328,400	$ 56,450	$103,900	$ 18,050
2	303,050	79,600	216,450	58,300	86,600	21,300
3	237,300	42,650	154,000	29,450	83,300	13,200
4	288,700	39,650	190,750	30,650	97,950	9,000
Total	$1,261,350	$236,400	$ 889,600	$174,850	$371,750	$ 61,550
1983-1 qtr.	$ 285,550	$ 29,300	$ 205,850	$ 18,250	$ 79,700	$ 11,050
2	366,700	32,400	250,300	19,000	116,400	13,400
3	439,450	28,700	305,900	16,300	133,550	12,400
4	466,500	47,550	307,400	28,650	159,100	18,900
Total	$1,558,200	$137,950	$1,069,450	$ 82,200	$488,750	$ 55,750
1984-1 qtr.	$ 551,900	$ 48,550	$ 376,100	$ 36,650	$175,800	$ 11,900
2	654,650	109,750	410,750	88,450	243,900	21,300
3	734,950	65,250	439,150	53,850	295,800	11,400
4	689,550	61,200	473,550	37,300	216,000	23,900
Total	$2,631,050	$284,750	$1,699,550	$216,250	$931,500	$ 68,500
1985-1 qtr.	$ 663,250	$ 65,000	$ 475,500	$ 53,000	$187,650	$ 12,000
2	582,450	58,950	430,150	45,550	152,300	13,400
3	465,350	93,100	338,800	65,950	126,550	27,150
4	551,100	48,900	407,700	36,450	143,400	12,450
Total	$2,262,150	$265,950	$1,652,150	$200,950	$610,000	$ 65,000
1986-1 qtr.	$ 570,000	$ 45,750	$ 431,450	$ 32,050	$138,550	$ 13,700
2	536,800	63,800	382,450	52,200	154,350	11,600
3	387,900	71,750	297,800	46,250	90,100	25,500
4	388,650	60,650	264,850	37,200	123,800	23,450
Total	$1,883,350	$241,950	$1,376,550	$167,700	$506,800	$ 74,250
1987-1 qtr.	$ 396,250	$ 67,450	$ 291,550	$ 34,550	$104,700	$ 32,900
2	463,550	57,600	303,600	35,700	159,950	21,900
3	412,450	75,400	291,600	32,950	120,850	42,450
4	558,250	87,850	407,700	53,800	150,550	34,050
Total	$1,830,500	$288,300	$1,294,450	$157,000	$536,050	$131,300

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS
By Type of Machine, 1979 to Date
(Millions of Dollars)

	1979	1980	1981	1982	1983	1984	1985	1986
MACHINE TOOLS TOTAL	$5,762.3	$6,701.5	$7,206.1	$5,538.6	$3,664.1	$4,177.6	$4,353.2	$4,369.2
METAL CUTTING TOTAL	$4,127.5	$4,952.3	$5,554.0	$4,154.7	$2,544.9	$2,815.0	$2,920.7	$2,939.7
Boring Machines	169.9	200.0	227.0	198.7	103.2	102.7	88.1	85.1
Drilling Machine	167.1	188.8	155.0	67.3	36.2	40.1	47.8	44.6
Gear Cutting	104.6	124.7	132.5	87.3	40.3	41.6	56.5	57.8
Grinding & Polishing Machines (a)	464.5	553.8	623.3	515.3	331.6	378.3	412.4	412.4
Lathes	675.7	823.0	865.3	523.6	306.5	300.6	313.0	265.3
Milling Machines	259.3	(322.0)	390.4	264.5	145.4	184.6	185.5	154.0
Machining Centers	(d)	(d)	(d)	365.7	184.5	215.3	230.9	227.8
Station Type Machines	(d)	(d)	(d)	735.4	271.9	330.3	388.3	516.1
Other Machine Tools (b,d)	1,279.3	1,620.8	1,838.3	336.3	253.3	257.1	279.7	234.8
Parts (c)	813.7	877.3	1,038.2	891.9	694.6	794.6	732.4	740.1
Not Specified by Kind	(193.3)	(241.8)	(284.0)	168.7	177.5	169.8	186.1	201.8
METAL FORMING TOTAL	1,634.8	1,749.2	1,652.1	1,383.9	1,119.2	1,362.6	1,432.5	1,429.5
Punching, Shearing, Bending & Forming	389.9	429.0	444.1	317.3	242.3	355.4	376.1	303.3
Presses	449.5	498.5	422.7	369.2	176.5	247.7	281.5	306.6
Other (b)	264.4	238.9	221.4	217.0	168.9	178.4	200.1	219.5
Parts (c)	482.5	530.8	498.4	380.0	430.7	482.7	480.2	505.8
Not Specified by Kind	48.5	52.0	65.5	100.5	100.8	98.4	94.7	94.2

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines; for 1979 - 86 honing and lapping machines are included.

(b) Including those designed primarily for Home Workshops, Laboratories, etc.

(c) Data represents parts sold separately and rebuilt machine tools.

(d) For 1979-1981, machining centers and station type machines are included in "Other Machine Tools."

( ) Indicates standard errors exceeding 15%.

This table, includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

Sources: U.S. Bureau of the Census; "Census of Manufacturers, Metal Working Machinery and Equipment" and "Annual Survey of Manufacturers."

SHIPMENTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date (a)

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$ 648,368	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,982	764,453	57,503	737,051	113,479	27,402
1962	190,288	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,685	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73,517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	129,479E
1980	323,899	4,812,349	88,428E	4,674,068E	235,471E	138,281E
1981	301,313	5,111,253	87,981E	5,007,848E	213,332E	103,405E
1982	178,638	3,804,250	53,141E	3,738,397E	125,497E	65,853E
1983	150,837	2,144,849	43,199E	1,986,212E	107,638E	58,637E
1984(r)	162,438	2,426,382	49,511E	2,362,268E	112,927E	64,114E
1985(r)	147,147	2,682,202	50,108E	2,623,563E	97,039E	58,639E
1986(r)	139,405	2,747,881	45,981E	2,691,268E	93,424E	56,613E
1987(p)	139,988E	2,584,999E	41,992E	2,528,843E	97,996E	56,156E

p - Preliminary. r - Revised. NA - Not Available. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date
(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22,075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,360	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,884
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,980E
1980	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981	234,647	4,046,940	66,076E	3,978,970E	168,571E	67,970E
1982	130,434	2,940,626	35,060E	2,899,429E	95,374E	41,197E
1983	100,764	1,564,204	27,088E	1,532,210E	73,676E	31,994E
1984(r)	105,740	1,688,296	31,737E	1,654,269E	74,003E	34,027E
1985(r)	93,802	1,877,289	31,425E	1,846,840E	62,377E	30,449E
1986(r)	90,007	1,962,313	27,991E	1,931,068E	62,016E	31,245E
1987(p)	91,586	1,778,415	25,076E	1,747,446E	66,510E	30,969E

p - Preliminary. r - Revised. NA - Not available. E - Estimated by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date (a)

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981	66,666	1,064,313	21,905	1,028,878	44,761	35,435
1982	48,204	863,624	18,081	838,968	30,123	24,656
1983	50,073	580,645	16,111	554,002	33,962	26,643
1984	56,698	738,086	17,774	707,999	38,924	30,087
1985(r)	53,345	804,912	18,683	776,722	34,662	28,190
1986(r)	49,398	785,568	17,990	760,200	31,408	25,368
1987(p)	48,402E	806,584E	16,916E	781,397E	31,486E	25,187E

p - Preliminary. r - Revised. NA - Not Available. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series, MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1955 to Date

(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417(a) Other Metal Cutting Machines
1955	$ 665.8	$ 77.4	$ 53.8	$ 36.6	$123.9	$153.3	$ 89.6	$ 131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	66.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980	3,716.4	192.0	166.9	130.3	555.8	827.0	339.3	1,505.2
1981	4,046.9	231.0	140.0	133.1	615.4	816.8	436.6	1,674.2
1982	2,940.6	193.8	65.9	86.5	486.7	507.3	265.6	1,334.9
1983	1,564.2	95.8	41.1	35.8	280.8	320.9	146.5	643.4
1984	1,688.3	96.1	37.2	40.0	335.6	307.6	179.9	689.5
1985(r)	1,877.3	85.1	43.8	51.8	415.0	318.7	180.6	782.3
1986(r)	1,962.3	83.9	40.0	57.3	419.7	262.0	161.2	938.2
1987(p)	1,778.4	106.8	45.2	59.6	382.2	280.3	212.8	691.5

p - Preliminary. r - Revised.

(a) Beginning in 1982, Code 35417 was changed to 3541A, 3541B, and 3541C.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1955 to Date

(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417(a) Other Metal Cutting Machines
1955	11.6%	8.1%	5.5%	18.6%	23.0%	13.5%	19.7%
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	6.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	18.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980	5.2	4.5	3.5	15.0	22.3	9.1	40.5
1981	5.7	3.5	3.3	15.2	20.2	10.8	41.4
1982	6.6	2.2	2.9	16.6	17.3	9.0	45.4
1983	6.1	2.6	2.3	18.0	20.5	9.4	41.1
1984	5.7	2.2	2.5	19.9	18.2	10.7	40.8
1985(r)	4.5	2.3	2.8	22.1	17.0	9.6	41.7
1986(r)	4.3	2.0	2.9	21.4	13.4	8.2	47.8
1987(p)	6.0	2.5	3.4	21.5	15.8	12.0	38.9

p - Preliminary. r - Revised.

(a) Beginning in 1982, Code 35417 was changed to 3541A, 3541B, and 3541C.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1955 to Date

(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1955	$ 295.4	$170.8	$15.6	$ 28.9	$ 35.8	$ 44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0	84.7	181.2	183.4	143.5
1980	1,096.0	440.8	73.8	204.2	214.9	162.3
1981	1,064.3	429.6	79.0	206.1	212.8	136.8
1982	863.6	344.8	79.0	142.2	166.5	131.1
1983	580.6	160.8	48.0	120.1	138.6	113.1
1984	738.1	230.1	29.0	139.2	177.9	161.9
1985(r)	804.9	254.0	35.4	144.0	178.4	193.1
1986(r)	785.6	293.1	15.1	122.3	172.1	183.0
1987(p)	806.6E	270.9	39.6E	161.9	178.8	155.4

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1955 to Date
(Percentage of Dollar Value)

Year	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1955	57.8%	5.3%	9.8%	12.1%	15.0%
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3	8.2	17.6	17.9	14.0
1980	40.2	6.7	18.6	19.6	14.8
1981	40.4	7.4	19.4	20.0	12.9
1982	39.9	9.1	16.5	19.3	15.2
1983	27.7	8.3	20.7	23.9	19.5
1984	31.2	3.9	18.9	24.1	21.9
1985(r)	31.6	4.4	17.9	22.2	24.0
1986(r)	37.3	1.9	15.6	21.9	23.3
1987(p)	33.6	4.9E	20.1	22.2	19.3

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
TOTAL						
	1970(a)	1,901	$ 209.0	1982(g)	6,066	$1,126.6
	1971(a)	1,238	153.2	1983(g)	4,781	677.1
	1972(a)	1,630	170.1	1984(g)	5,581	739.5
	1973(a)	2,865	272.1	1985(r,g)	5,518	792.0
	1974(a)	4,210	378.7	1986(r)	5,741	835.5
	1975(a)	4,136	504.7	1987(p)	6,049	894.2
	1976(a)	3,856	501.0			
	1977(a)	4,482	496.7			
	1978(a)	5,683	649.2			
	1979(g)	7,925	1,014.6			
	1980(g)	9,984	1,371.7			
	1981(g)	8,945	1,467.3			
Boring Machines						
	1970	175	29.5	1982	231	110.7
	1971	92	18.4	1983	69	37.1
	1972	84	21.0	1984	119	45.1
	1973	128	26.8	1985	89	35.4
	1974	146	33.7	1986(r)	117	45.9
	1975	153	39.4	1987(p)	120	55.2
	1976	120	35.6			
	1977	101	33.0			
	1978	127	47.3			
	1979	186	69.6			
	1980	226	92.5			
	1981	293	120.2			
Drilling Machines (h)						
	1970	215	13.0	1982	0	0
	1971	138	11.3	1983	0	0
	1972	118	8.4	1984	0	0
	1973	326	19.0	1985(r)	(b)	(b)
	1974	216	11.7	1986	(b)	(b)
	1975	100	11.0	1987(p)	(b)	(b)
	1976	197	13.2			
	1977	288	20.0			
	1978	321	22.0			
	1979	237	17.7			
	1980	384	33.4			
	1981	455	52.8			
Lathes						
	1970	507	55.3	1982	1,489	333.4
	1971	428	50.4	1983	1,202	224.6
	1972	570	67.1	1984	1,497	207.8
	1973(c)	1,031	95.2	1985	1,420	225.2
	1974	1,381	137.3	1986	1,163	188.1
	1975	1,640	212.7	1987(p)	1,607	218.6
	1976	1,321	205.9			
	1977	1,178	195.3			
	1978	1,464	237.2			
	1979	2,362	347.7			
	1980	2,739	481.2			
	1981	2,021	441.4			

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
Milling Machines (d)						
	1970	150	$ 23.4	1982	1,061	$185.6
	1971	105	12.6	1983	1,091	108.9
	1972	229	15.8	1984	1,434	108.9
	1973	240	16.1	1985	1,087	99.6
	1979	2,045	93.8	1986(r)	1,122	106.2
	1980	2,600	162.7	1987(p)	818	113.2
	1981	1,763	190.6			
Machining Centers						
	1970	651	68.9	1982(i)	1,396	357.6
	1971	344	46.6	1983(i)	1,005	182.9
	1972	475	45.3	1984	1,237	213.2
	1973	1,162	115.1	1985	1,077	214.7
	1974	1,692	163.1	1986(r)	918	206.4
	1975	1,460	196.8	1987(p)	1,031	192.0
	1976	1,225	178.4			
	1977	1,201	175.0			
	1978	1,486	246.0			
	1979	1,953	356.5			
	1980	2,132	413.0			
	1981	2,081	482.7			
Grinding and Polishing Machines						
	1980	271	32.9	1984	546	65.9
	1981	645	46.7	1985	724	122.4
	1982	590	49.6	1986(r)	809	144.1
	1983	494	42.7	1987(p)	765	135.7
All Other Metal Cutting and Metal Forming Type Machine Tools						
	1970	203	19.0	1982(g)	1,299	89.6
	1971	131	13.9	1983(g)	920	80.9
	1972	154	12.6	1984(g)	748	98.6
	1973(a,e)	17	5.0	1985(r,g)	1,121	94.7
	1974(a,f)	775	32.8	1986(r)	1,612	144.8
	1975(a,f)	783	44.8	1987(p)	1,708	179.5
	1976(a,f)	993	67.9			
	1977(a,f)	1,714	73.4			
	1978(a,f)	2,290	96.7			
	1979(g)	936	100.7			
	1980(g)	1,632	156.0			
	1981(g)	1,667	133.0			

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) "Drilling Machines" are included in the "All Other" category.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.
(h) The data for 1982 and 1983 should have been reported in "Machining Centers." It is possible that the data for 1970 through 1981 was misclassified and/or overstated.
(i) The data for 1982 and 1983 reflect the addition of misclassified data, originally reported in "Drilling Machines."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY
By Type of Control
Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
TOTAL						
1964	1,517	$ 105.5	$ 29.2	987	$ 113.7	$ 26.4
1965	2,100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	26.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	6.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	732	211.4	41.4
1968	991	198.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	108.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	266	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS								
TOTAL	1,793	1,699	994	455	475	425	485	518
Horizontal Boring, Drilling & Milling Machines								
Table Type	102	115	77	29	28E	D	D	D
Floor Type	72	29						
Precision Boring Machines	771	661	564	370	400	372	431	474
Jig Boring Machines	848	894	353	56(a)	47E(a)	D(a)	D(a)	D(a)
All Other Boring Machines								
VALUE (Millions of Dollars)								
TOTAL	$192.0	$231.0	$193.8	$95.8	$96.1	$85.1	$83.9	$106.8
Horizontal Boring, Drilling and Milling Machines								
Table Type	41.4	53.0	51.4	20.5	35.3E	D	D	D
Floor Type	23.8	15.5						
Precision Boring Machines	96.3	122.1	109.7	60.5	49.7	48.9	62.1	84.3
Jig Boring Machines	30.5	40.4	32.7	14.8(a)	9.5E(a)	D(a)	D(a)	D(a)
All Other Boring Machines								

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Data withheld to avoid disclosure.

(a) There were no machines valued less than $2,500.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986	1987(p)
UNITS								
TOTAL	931	837	445	158	199	243	253	204
Gear Tooth Finishing Machines(a)	432	254	160	90	103	164	253	204
Gear Hobbers-Horizontal and Vertical(b)	499	523	285	68	96	79		
All Other Gear Cutting Machines	(c)	(c)	0	0	(c)	(c)	0	0
VALUE (Millions of Dollars)								
TOTAL	$130.3	$133.1	$86.5	$35.8	$42.4	$51.8	$57.3	$59.6
Gear Tooth Finishing Machines (a)	69.0	55.3	39.9	24.8	24.3	34.6	57.3	59.6
Gear Hobbers-Horizontal and Vertical (b)	61.3	77.9	46.7	10.9	18.0	17.2		
All Other Gear Cutting Machines	(c)	(c)	0	0	(c)	(c)	0	0

p - Preliminary.

(a) Includes bevel gear generators.
(b) Includes gear shapers.
(c) Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
UNITS								
TOTAL	34,898	27,195	17,046	13,094	12,051	9,834	8,031	7,227
Unit Value Under $2,500	31,474	24,129	15,491	12,269	11,078	8,385	6,742	5,962
Unit Value $2,500 and Over	3,424	3,066	1,555	825	973	1,449	1,289	1,265
Vertical Drilling Machines	1,089	892	546	298	342	310	291	324
Radial Drilling Machines	232	331	163	122	100	165	125	123
Deep Hole Drilling Machines	190	154	110					
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	628	522	366	225	216	775	752	720
Automatic Drilling All Other	(a)	(a)	272	180	315	199	121	98
All Other Drilling Machines	1,285	1,167	78					
VALUE (Millions of Dollars)								
TOTAL	$186.9	$139.9	$65.9	$41.1	$37.2	$43.8	$40.0	$45.2
Unit Value Under $2,500	18.6	20.2	12.0	11.3	9.7	8.8	9.9	9.8
Unit Value $2,500 & Over	148.3	119.8	53.9	29.8	27.5	35.0	30.1	35.4
Vertical Drilling Machines	22.7	22.1	6.7	6.9	5.0	4.0	3.3	2.9
Radial Drilling Machines	12.6	14.0	5.3	7.4	7.1	10.3	8.7	9.7
Deep Hole Drilling Machines	10.6	15.7	10.4					
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	26.2	20.1	10.7	6.6	7.4	13.6	12.0	17.3
Automatic Drilling All Other	(a)	(a)	15.6	8.8	8.0	7.2	6.1	5.5
All Other Drilling Machines	76.2	47.8	5.2					

p - Preliminary. r - Revised.

(a) Included with "All Other Drilling Machines."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units, 1981 to Date

Products	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS							
TOTAL	16,904	4,508	3,695	4,300	3,836	3,057	3,098
NUMERICALLY CONTROLLED							
UNIT VALUE OVER $2,500							
Turning Machines-Horizontal Spindle							
Small	977	775	793	1,005	1,076	891	1,350
Medium	541	308	194	252	164	112	96
Large	266	212	116	75	104	68	65
Turning Machines-Vertical Spindle	237	194	99	165	76	92	96
Turret & Boring Machines over 30"							
All Other							
NON-NUMERICALLY CONTROLLED							
UNIT VALUE UNDER $2,500	D	247	250	45E	15E	20E	10E
UNIT VALUE $2,500 and Over	D	2,772	2,243	2,758E	2,401E	1,874E	1,481E
Mfg, Tool Room and Engine & Tool Room (Light and Heavy)							
Floor Mounted							
0" to 16" Swing Over Cross Slide	2,657	1,374	1,184	344(a)	278(a)	716	668
17" and Over	240	157	63	72	D	152	
All Other Engine & Tool Room Lathes							
Turret Lathes							
Horizontal Type	D	D	422	D	D	300	D
Automatic Lathes-Single Spindle							
Bar (Screw) Machines	D	D	D	D	D	D	D
Chucking Machines	357	142	D	D	D	D	D
Automatic Lathes-Multiple Spindle							
Bar (Screw) Machines	809	293	233	334	231	169	D
Chucking Machines	131	54	D	D	D	D	D
Automatic Between Center Lathes	182	62	13	D	D	0	311
All Other Horizontal Turning Machines						D	
Vertical Turret Lathes and Boring Machines	D	D	D	D	D	0	D
All Other Vertical Turning Machines	D	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D	D

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Withheld to avoid disclosure.

(a) Includes "Over 8 inches to 16 inches" only.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Value, 1981 to Date
(Millions of Dollars)

Products	1981	1982	1983	1984	1985	1986(r)	1987(p)
VALUE							
TOTAL	$816.8	$507.3	$320.9	$307.6	$318.7	$262.0	$280.3
NUMERICALLY CONTROLLED							
AVERAGE OVER $2,500							
Turning Machines-Horizontal Spindle							
Small	$134.2	$ 87.9	$ 84.1	$108.1	$131.9	$105.9	$119.4
Medium	128.7	74.8	41.1	47.2	31.4	20.5	24.1
Large	83.7	75.8	48.0	22.5	26.4	17.1	32.5
Turning Machines-Vertical Spindle	94.8	94.8	51.3	29.9	35.5	44.5	42.6
Turret & Boring Machines over 30"							
All Other							
NON-NUMERICALLY CONTROLLED							
UNIT VALUE UNDER $2,500	D	0.5	0.7	1.0E	(b)	(b)	(b)
UNIT VALUE $2,500 and Over	D	173.4	95.7	98.9E	93.4	73.6	61.6
Mfg. Tool Room Lathes and Engine & Tool Room (Light and Heavy)							
Floor Mounted							
0" to 16" Swing Over Cross Slide	27.9	20.5	15.9	5.9(a)	3.0(a)	12.5	16.6
17" and Over	27.8	20.5	9.5	10.4	D	6.9	
All Other Engine and Tool Room Lathes							
Turret Lathes							
Horizontal Type	D	D	6.8	D	D	6.0	D
Automatic Lathes-Single Spindle							
Bar (Screw) Machines	D	D	D	D	D	D	D
Chucking Machines	26.1	8.4	D	D	D	D	D
Automatic Lathes-Multiple Spindle							
Bar (Screw) Machines	99.6	40.7	24.3	29.6	28.4	18.8	D
Chucking Machines	30.9	14.1	D	D	D	D	D
Automatic Between Center Lathes	46.8	15.7	2.6	D	D	0	17.4
All Other Horizontal Turning Machines						D	
Vertical Turret Lathes and Boring Machines	D	D	D	D	D	0	D
All Other Vertical Turning Machines	D	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D	D

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Withheld to avoid disclosure.

(a) Includes "Over 8 inches to 16 inches" only.
(b) Value less than $50,000.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES
Units, 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS								
TOTAL	97,004	91,548	58,362	56,864	60,189	51,807	54,534	59,333
Unit Value Under $2,500	79,509	76,687	48,651	50,512	51,614	42,647	46,627	52,378
Unit Value $2,500 and Over	17,495	14,861	9,711	6,352	8,575	9,160	7,907	6,955
External Cylindrical Grinding Machines								
Plain	297	383	394	140	104	93	77	78
Universal	305	291	302	242	216	208	151	103
Roll and Centerless All Other External (a)	935	880	637	378	366	538	513	543
Internal Cylindrical Grinding Machines	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Surface Grinding Machines								
Rotary Table Type	348	264	152	120	137	117	84	70
Reciprocating Table Type								
Vertical and Horizontal	2,941	1,850	1,270	862	1,042	1,031	619	421
Hand Surface Type	3,523	1,822	1,310	1,251	1,708	1,646	1,303	878
Planer Type and All Other	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Bench, Floor and Snag Grinders	537	484	469	316	460	407	322	320
Tool and Cutter Grinding Machines	2,610	2,818	1,568	851	955	1,333	1,439	808
Polishing and Buffing Machines								
Stand, drum & disc types	326	309	(b)	(b)	332	314	310	333
All Other Polishing	1,581	1,501	650	501	812	885	947	1,079
Honing and Lapping Machines								
Honing Machines (Except Gear)								
Internal and External	1,871	1,486	1,002	(b)	(b)	(b)	1,004	(b)
Flat Surface Lapping Machines	247	224	165	270	268	256	170	187
All Other Honing and Lapping Machines	370	354	(b)	(b)	(b)	(b)	(b)	(b)
All Other (c)	1,604	2,195	1,792	1,421	2,175	2,332	968	2,135

p - Preliminary. r - Revised.

(a) Includes chucking grinders.
(b) Included in "All Other."
(c) This item includes items not disclosed, see footnote (b).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES
Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
VALUE (Millions of Dollars)								
TOTAL	$555.8	$615.4	$436.7	$280.8	$335.6	$415.0	$419.7	$382.2
Unit Value Under $2,500	16.8	17.9	13.2	12.1	13.7	10.8	11.4	12.8
Unit Value $ 2,500 and Over	539.0	597.5	473.5	268.7	321.9	404.2	408.3	369.4
External Cylindrical Grinding Machines								
Plain	42.1	63.9	68.9	30.2	22.9	21.4	21.7	20.1
Universal	17.7	18.6	23.7	18.2	14.5	15.5	12.1	5.6
Roll and Centerless	132.0	160.8	93.6	44.3	47.2	72.8	85.0	75.9
All Other External (a)								
Internal Cylindrical Grinding Machines	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Surface Grinding Machines								
Rotary Table Type	36.7	36.5	21.4	19.2	21.9	17.0	16.4	16.4
Reciprocating Table Type								
Vertical and Horizontal	49.1	37.7	35.4	14.1	24.1	20.5	16.5	13.3
Hand Surface Type	21.6	13.8	11.2	8.3	13.9	11.5	9.2	8.9
Planer Type and All Other	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Bench, Floor and Snag Grinders	6.2	7.3	3.5	2.2	7.6	5.0	8.4	12.1
Tool and Cutter Grinding Machines	32.5	36.4	31.1	28.4	35.0	55.2	58.6	46.1
Polishing and Buffing Machines								
Stand, drum & disc types	5.8	8.6	(b)	(b)	4.6	6.2	4.9	6.0
All Other Polishing	28.7	33.2	24.4	14.4	22.4	25.1	31.3	21.1
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	29.1	28.3	23.0	(b)	(b)	(b)	32.7	(b)
Flat Surface Lapping Machines	5.0	4.0	4.3	5.9	8.9	10.4	6.2	8.6
All Other Honing and Lapping Machines	11.7	13.9	(b)	(b)	(b)	(b)	(b)	(b)
All Other (c)	120.8	134.5	133.0	83.5	98.9	143.6	105.3	134.3

p - Preliminary. r - Revised.

(a) Includes chucking grinders.
(b) Included in "All Other."
(c) This item includes items not disclosed, see footnote (b).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
UNITS								
TOTAL	76,770	77,220	39,946	18,246	19,308	18,272	14,757	13,905
Unit Value Under $2,500	64,819	64,347	29,990	9,609	10,816	11,009	7,882	7,375
Unit Value $2,500 and Over	11,951	12,873	9,956	8,637	8,492	7,263	6,875	6,530
Broaching Machines	269	204	166	120	143	144	126	81
Sawing and Cutoff Machines								
Power Hack Saws	556	509	562	1,032	617	124	137	108
Circular Cutoff Saws	142	145	100	102	140	168	(a)	(a)
Abrasive Wheel Saws	526	497	322	219	166			
Band Saw	4,223	5,316	4,066	2,971	3,565	3,488	2,719	2,904
All Other	619	840	1,228	1,180	817	747	615	552
Tapping Machines	286	412	373	460	704	206	(a)	(a)
Station Type Machines								
Dial or Rotary	451	491	270	270	318	239	298	278
Way Type	126	64	54	46	(a)			
Transfer	517	439	346	138	173	192	213	94
Other, N.E.C.	218	185	122	121	(a)	100	130	53
Electrical Discharge Machines (EDM) Electrochemical Machines (ECM)	2,234	1,725	1,113	1,055	1,082	1,027	938	1,026
All Other Metal Cutting Machines (b)	1,784	2,046	1,214	923	767	828	1,699	1,434

p - Preliminary. r - Revised.

(a) Included with "All Other."

(b) Includes items not disclosed due to confidentiality considerations, see footnote (a).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
VALUE (Millions of Dollars)								
TOTAL	$1,092.2	$1,191.5	$977.3	$460.5	$476.3	$567.6	$731.7	$499.6
Unit Value Under $2,500	31.7	25.7	14.8	7.2	9.6	10.3	8.8	7.4
Unit Value $ 2,500 and Over	1,060.5	1,165.8	962.5	453.3	466.7	557.4	722.9	492.2
Broaching Machines	33.6	36.0	38.3	15.1	19.6	18.9	22.8	10.6
Sawing and Cutoff Machines								
Power Hack Saws	3.4	3.2	3.4	5.2	3.2	0.9	1.2	1.3
Circular Cutoff Saws	11.6	22.2	5.1	2.3	2.9	6.1	(a)	(a)
Abrasive Wheel Saws	4.7	5.5	3.5	2.4	2.3			
Band Saws	50.9	56.8	49.6	29.1	36.7	35.3	27.6	26.1
All Other	20.5	24.0	37.1	24.7	16.3	19.2	15.9	14.8
Tapping Machines	6.7	7.2	7.7	7.0	13.1	15.3	(a)	(a)
Station Type Machines								
Dial or Rotary	80.0	70.1	48.0	25.6	35.7	45.3	132.1	122.1
Way Type	32.8	38.7	57.8	25.6	(a)			
Transfer	592.6	684.5	540.4	153.4	221.8	290.1	322.8	144.6
Other, N.E.C.	108.1	102.8	84.9	69.5	(a)	70.7	62.8	29.6
Electrical Discharge Machines (EDM)	78.1	66.9	35.8	48.5	30.1	32.1	33.2	57.4
Electrochemical Machines(ECM)								
All Other Metal Cutting Machines (b)	37.6	47.8	51.0	44.9	85.0	23.4	104.5	85.7

p - Preliminary. r - Revised.

(a) Included with "All Other."

(b) Includes items not disclosed due to confidentiality considerations, see footnote (a).

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS
Units and Value, 1981 to date

Products	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS							
TOTAL	2,081	1,396	1,005	1,237	1,077	918	1,031
Unit Value over $2,500							
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	263	249	133	(a)	(a)	(a)	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)							
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)	452	341	296	229
Y-axis Travel 20 Inches to 26 Inches	539	309	210	241	224	181	329
Y-axis Travel Over 26 Inches	280	193	91	122	96	67	95
Drill, Mill, Bore-Horizontal (Automatic Tool Change)							
Y-axis Travel Less Than 27 Inches	429	237	114	171	143	(a)	(a)
Y-axis Travel 27 Inches to 40 Inches	233	166	64	71E	139	59	(a)
Y-axis Travel Over 40 Inches	127	107	36	19E		94	84
All Other Machining Centers (b)	210	135	357	161E	134	221	294
VALUE (Millions of Dollars)							
TOTAL	$482.7	$357.6	$182.9	$213.2	$214.7	$206.4	$192.0
Unit Value over $2,500							
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	32.4	33.2	18.5	(a)	(a)	(a)	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)							
Y-axis Travel Less than 20 Inches	(a)	(a)	38.4	38.4	30.8	26.0	18.1
Y-axis Travel 20 Inches to 26 Inches	84.7	48.1	28.3	32.5	32.0	25.1	36.9
Y-axis Travel Over 26 Inches	59.4	39.8	17.6	24.0	22.1	15.2	18.4
Drill, Mill, Bore-Horizontal (Automatic Tool Change)							
Y-axis Travel Less Than 27 Inches	106.7	72.3	29.9	46.8	37.2	(a)	(a)
Y-axis Travel 27 Inches to 40 Inches	88.3	66.4	26.3	34.5E	70.4	22.5	(a)
Y-axis Travel Over 40 Inches	80.8	79.7	27.2	16.3E		66.3	57.9
All Other Machining Centers (b)	30.4	18.1	35.1	20.7E	22.2E	51.3E	60.7

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Included in "All Other Machining Centers."

(b) This item includes "All Other Machining Centers" and those items not disclosed due to confidentiality considerations, see footnote (a).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1981 to Date

Products	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
UNITS							
TOTAL	17,193	7,737	7,247	7,961	8,308	7,973	6,270
Unit Value Under $2,500	1,349	921	1,036	450E	320E	745E	785E
Unit Value $2,500 and Over	15,844	6,816	6,211	7,531E	7,988E	7,228E	5,485E
General Purpose, Knee or Bed:							
Horizontal, Plain, Universal, and Ram	14,071	5,850	5,445	D	D	D	D
Vertical, except Ram							
Vertical Ram							
Automatic and manufacturing:							
Single spindle	356	228	177	197	143	175	D
Multiple spindle and special purpose machines	848	429	347	D	D	D	428
Profile machines and duplicators	286	309	242	179	186	203	177
Die Sinking and engraving machines	283						
All Other Milling Machines							
VALUE (Millions of Dollars)							
TOTAL	$436.6	$265.6	$146.5	$179.9	$180.6	$161.2	$212.8
Unit Value Under $2,500	1.0	0.6	0.8	1.0E	0.5E	1.0E	1.0E
Unit Value $2,500 and Over	435.6	265.0	145.7	178.9E	180.1E	160.2E	211.8E
General Purpose, Knee or Bed:							
Horizontal, Plain, Universal, and Ram	140.1	64.4	71.4	D	D	D	D
Vertical, except Ram							
Vertical Ram							
Automatic and manufacturing:							
Single spindle	37.3	21.9	7.6	10.9	6.2	7.5	D
Multiple spindle and special purpose machines	53.9	21.9	22.9	D	D	D	18.7
Profile machines and duplicators	157.3	155.7	47.3	60.0	83.8	77.7	138.9
Die Sinking and engraving machines	47.0						
All Other Milling Machine							

p - Preliminary. r - Revised. E - Estimated by NMTBA.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Units and Value, 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
UNITS								
TOTAL	75,336	66,666	48,204	50,073	56,698	53,345	49,398	48,402E
Punching, Shearing, Bending and Forming	46,017	40,602	29,738	31,251	35,104	33,164	28,941	25,851
Punching and Shearing (a)	5,396	5,423	3,736	2,784	3,164	3,548	3,427	3,628
Bending and Forming (a)	9,242	7,472	5,990	5,958	6,295	7,042	6,584	6,752
Presses	20,428	18,030	11,765	9,665	10,814	9,137	9,439	8,157
Presses (a)	5,764	4,123	3,147	2,419	2,722	2,611	2,685	2,572
Other Metal Forming Machine Tools	8,891	8,034	6,701	9,157	10,780	11,044	11,018	14,394E
VALUE (Millions of Dollars)								
TOTAL	$1,096.0	$1,064.3	$863.6	$580.6	$738.1	$804.9	$785.6	$806.6E
Punching, Shearing, Bending and Forming	419.1	418.9	308.8	258.7	317.1	322.5	294.4	340.7
Punching and Shearing(a)	196.7	198.1	136.5	114.2	132.4	137.4	117.6	157.9
Bending and Forming(a)	202.6	200.5	156.5	127.0	165.4	166.7	162.0	167.3
Presses	440.8	429.6	344.8	160.8	230.1	254.0	293.1	270.9
Presses (a)	429.9	418.6	338.3	156.1	224.9	250.0	288.1	266.9
Other Metal Forming Machine Tools	236.1	215.8	210.0	161.1	190.9	228.4	198.1	195.0E

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Machine tools under $2,500 are not included so the individual items do not add to the totals.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES
Units and Value (a), 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	78	39	82	55	65	44	55	D
Column and Open Rod Type	443	347	268	141	219	236	95	D
Gap or C-Frame								
15 Tons and Under	546	483	450	366	137	83	438	472
16-35 Tons	63	55	99		29E	55	48	D
Over 35 Tons	140	98			56	62	63	D
Vertical Multiple Action, All Tonnages, Extrusion and Horizontal Presses	1,137	702	569	D	D	615	D	D
All Other Hydraulic Presses							699	557
Value (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	$16.7	$16.3	$30.0	$12.1	$14.2	$9.6	$11.1	D
Column and Open Rod Type	11.7	8.5	7.3	7.4	13.2	9.3	5.8	D
Gap or C-Frame								
15 Ton and Under	5.2	4.6	9.3	4.3	2.1	2.2	3.4	$3.7
16-35 Tons	1.5	1.6	4.8		0.9E	1.6	2.0	D
Over 35 Tons	6.7	4.9			5.9	4.1	4.4	D
Vertical Multiple Action, All Tonnages, Extrusion and Horizontal Presses	45.8	50.0	53.8	D	D	31.4	D	D
All Other Hydraulic Presses							17.2	23.1

p - Preliminary. r - Revised. E - Estimated by NMTBA. D - Withheld to avoid disclosure.

(a) Unit value $2,500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

SHIPMENTS OF MECHANICAL PRESSES

Units and Value (a), 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS								
Open Back Inclinable, Gap Type								
50 Tons and Under	954	642	433	435	496	570	430	425
51 Tons to 120 Tons	717	444	255	205	269	243	205	152
120 Tons and Over	103	87	D	D	D		61	D
Vertical Straight-sided and Arch Frame Single Action								
Single Point	57	90	D	D	D	176	D	D
Two Point								
300 Tons and Under	244	154	137	D	152		72	56
301 Tons and Over	77	46					57	59
Gap and Horn Type	352	242	162	52	D	67	37	36
Automatic Presses	575	389	327	310	471	340	241	331
All Other Mechanical Presses	278	305	296	105	129	120	138	145
VALUE (Millions of Dollars)								
Open Back Inclinable, Gap Type								
50 Tons and Under	$ 15.9	$ 13.4	$ 9.6	$ 7.9	$ 9.2	$ 9.7	$ 8.2	$ 4.8
51 Tons to 120 Tons	27.5	19.1	11.0	8.0	14.0	14.1	13.2	7.2
120 Tons and Over	7.6	8.0	D	D	D		3.0	D
Vertical Straight-sided and Arch Frame Single Action								
Single Point	13.2	20.7	D	D	D	50.9	D	D
Two Point								
300 Tons and Under	31.3	25.5	43.1	D	27.4		12.4	12.6
301 Tons and Over	48.1	39.4					65.1	33.7
Gap and Horn Type	10.0	5.6	4.5	2.1	D	4.7	3.7	4.0
Automatic Presses	83.7	72.2	47.6	34.9	65.2	59.5	47.0	52.0
All Other Mechanical Presses	104.9	129.0	103.3	21.3	24.7	52.9	79.5	92.4

p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Unit value $2,500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES

Units (a), 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	2,300	2,512	1,870	1,112	1,293	1,667	1,551	1,671
Punching Machines, Fixed Position & Two Axes Positioning Table	822	678	407	392	516	327	444	394
Plate Shearing Machines	1,481	1,352	942	875	906	1,144	936	1,001
Bar and Angle, and Rotary Shearing Machines	186	186	152	133	108	99	94	99
Other Punching and Shearing Machines (Power or Manual)	607	695	365	272	341	311	402	463
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	503	409	262	259	265	301	281	292
Bending Rolls, Angles, Bars and Shapes (Power)	231	300	116	D	(b)	D	D	D
Press Brakes (Power):								
Mechanical	824	548	415	574	371	1,035	1,024	344
Hydraulic	1,540	904	612	599	799	641	615	746
Hydro-Mechanical		350	262	D	314	D	147	180
Rotary Bending and Forming (Power)	1,275	1,200	1,051	1,483	1,675	1,979	1,893	2,004
Ram and Press Bending	1,287	1,017	819	360	347	D	D	D
Other Bending and Forming Machines (Power or Manual)	3,582	2,744	2,453	2,435	2,524	2,450	2,245	2,694

p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Unit value $2,500 or over.
(b) Included in "Rotary Bending & Forming (Power)."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES
Value (a), 1980 to Date

Products	1980	1981	1982	1983	1984	1985	1986(r)	1987(p)
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$21.7	$26.0	$21.4	$16.3	$15.6	$15.7	$13.8	$16.7
Punching Machines, Fixed Position & Two Axes Positioning Table	95.1	84.8	45.7	48.5	72.2	49.4	50.0	61.7
Plate Shearing Machines	61.0	65.9	55.2	40.8	37.9	60.3	35.4	43.1
Bar and Angle, and Rotary Shearing Machines	1.6	3.0	1.8	2.0	1.0	.7	1.0	15.1
Other Punching and Shearing Machines (Power or Manual)	17.4	18.3	12.3	6.6	5.8	11.4	17.4	21.3
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	24.2	25.7	13.9	5.7	6.0	8.5	6.0	4.5
Bending Rolls, Angles, Bars and Shapes (Power)	13.1	15.9	13.3	D	(b)	D	D	D
Press Brakes (Power):								
Mechanical	15.2	12.5	7.7	11.1	8.6	10.4	12.5	4.5
Hydraulic	50.8	40.7	28.0	20.3	37.9	29.0	29.4	38.4
Hydro-Mechanical		9.1	5.8	D	7.1	D	3.9	4.5
Rotary Bending and Forming (Power)	26.4	23.6	24.4	22.3	39.3	30.8	27.3	24.5
Ram and Press Bending	14.3	15.1	11.4	8.5	7.6	D	D	D
Other Bending and Forming Machines (Power or Manual)	58.6	57.9	52.1	41.7	58.9	60.2	58.7	66.6

p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Unit value $2,500 or over.
(b) Included in "Rotary Bending & Forming (Power)."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS
Units and Value (a), 1980 to Date

Products	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
UNITS								
Forging Machines	631	479	383	263	198	213	142	177E
Riveting Machines (Except Portables)	2,025	1,764	1,320	1,592	1,759	1,972	2,018	1,087
Thread Rolling Machinery	202	150	111	80	160	245	491	303
Die Casting Machines								
Under 500 Tons	123	112	75	102	170	167	139	134
501 and Over	94	56	31					
Metal Container Making Machines	2,766	2,326	1,349	1.105	949	707	697	821
All other Metal Forming, N.E.C.			1,939	1,808	2,357	2,178	1,807	1,442
VALUE (Millions of Dollars)								
Forging Machines	$73.8	$79.0	$79.0	$48.0	$29.0	$35.4	$15.1	$39.6E
Riveting Machines (Except Portables)	21.9	24.3	14.6	12.7	18.5	26.1	19.1	13.8
Thread Rolling Machinery	8.9	8.5	7.2	5.0	12.3	18.6	39.8	10.0
Die Casting Machines								
Under 500 Tons	12.4	11.5	8.0	18.4	38.0	44.9	35.3	36.8
501 Tons and Over	27.1	15.1	8.7					
Metal Container Making Machines	88.0	73.1	44.0	37.2	43.1	41.0	38.4	47.7
All other Metal Forming, N.E.C.			46.1	35.2	44.3	56.6	44.8	41.4

p - Preliminary. r - Revised. E - Estimated by NMTBA. N.E.C. - Not elsewhere classified.

(a) Unit value $2,500 or over.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS

Value of Shipments, by Industry, by Type, 1977 and 1982

(Millions of Dollars)

	All Industries		Shipped by					
			Metal Cutting Machine Tool Industry SIC 3541	Metal Forming Machine Tool Industry SIC 3542	Special Dies, Tools Jigs, & Fixtures Industry SIC 3544	Machine Tool Acces-sories Industry SIC 3545	Metal Working Machinery N.E.C. Industry SIC 3549	Other Industries
	1977	1982	1982					
Metal Cutting Machine Tools								
Total	$2,561	$4,155	$3,877	$25	$ 4	$75	$31	$143
Boring Machines	94	199	194	—	D	D	D	D
Drilling Machines	109	67	53	D	—	D	D	D
Gear Cutting & Finishing	67	87	D	—	—	D	—	—
Grinding & Polishing	288	515	469	1	—	D	D	D
Lathes	456	524	515	D	D	D	D	D
Milling Machines	168	265	251	10	—	D	D	D
Other Machine Tools (a)	714	1,437	1,328	D	D	D	D	D
Parts Sold Separately (b)	502	892	824	7	2	20	6	34
Not Specified	163	169	D	—	—	—	—	D
Metal Forming Machine Tools								
Total	$1,115	$1,384	$43	$1,211	$ 9	$ D	$ D	$ D
Punching, Shearing, Bending, and Forming Machines	280	317	D	287	D	—	4	D
Presses, incl. Forging Presses(c)	283	369	10	331	D	D	D	D
Other Metal Forming Tools	172	217	D	177	D	D	D	D
Parts & Rebuilt Machines	296	380	15	317	3	D	4	D
Not Specified	85	101	—	98	—	—	D	D

D - Withheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) In 1982, Forging Presses are included in "Other Metal Forming Tools."

Source: U.S. Bureau of the Census, "Census of Manufacturers 1982; MC82(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products." In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS

Fiscal Years 1984 to Date

(Thousands of Dollars)

	Year ending June 30			
	1984	1985	1986	1987
Saws and filing machines	$ 2,649	$ 1,965	$ 2,787	$ 4,003
Machining centers and way type machines	22,485	19,171	13,178	23,245
Electrical and ultrasonic erosion machines	1,320	1,645	3,732	3,567
Boring machines	6,249	8,324	12,013	3,935
Broaching machines	5,675	68	1,228	413
Drilling machines and tapping machines	5,309	2,433	6,808	2,944
Gear cutting and finishing machines	269	435	1,236	362
Grinding machines	14,682	18,662	25,480	20,838
Lathes	27,241	17,796	27,008	25,968
Milling machines	10,372	12,630	12,089	10,094
Planers and shapers	242	660	374	133
Miscel. machine tools	5,755	3,616	2,280	3,659
Total metal cutting machine tools	$102,248	$ 87,405	$108,213	$ 99,161
Bending and forming machines	$ 3,548	$ 7,410	$ 10,824	$ 9,436
Hydraulic and pneumatic presses	8,117	1,367	3,039	5,457
Mechanical presses, power driven	356	940	7,600	865
Manual presses	2,400	670	235	463
Punching and shearing machines	3,617	5,627	6,811	2,783
Forging machinery and hammers	1,479	289	2,753	748
Wire and metal ribbon forming machines	119	0	0	406
Riveting machines	54	358	226	70
Miscel. secondary forming & cutting mach.	192	424	780	561
Total metal forming machine tools	$ 19,882	$ 17,085	$ 32,268	$ 20,789
Total Machine Tools	$122,130	$104,490	$140,481	$119,950

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification."

5

U. S. MACHINE TOOL FOREIGN TRADE

Foreign trade has been a fact of life for the U.S. machine tool industry since the 1870s, when U.S. builders went to Europe seeking orders during the severe U.S. economic depression of 1873-1879. Just as European orders helped the industry then, Soviet business helped many builders keep their doors open in 1930 and 1931. Shipments to the Soviet Union alone accounted for 23% of U.S. production in 1931. During 1939-1944 machine tool trade with the United Kingdom and the Soviet Union increased by a multiple of four. In the years immediately after World War II, machine tool exports to Europe and Japan exploded. Then, in the sixties and seventies, U.S. demand for machine tools became the engine for expansion of machine tool trade and the industry's international growth. Today, as the eighties draw to a close, imports account for approximately half of U.S. machine tool consumption, while exports represent about one-fifth of U.S. production. In today's globalized economy, machine tool foreign trade has become an integral part of the U.S. machine tool industry.

Twenty-five years ago, U.S. exports represented more than 6% of world machine tool consumption; today U.S. exports supply slightly more than 2% of world demand. The decline in the U.S. share was the result of rapid market expansion and not a decline in nominal exports. Throughout the sixties U.S. machine tool exports were between \$200 and \$300 million per year. Then, in 1973, exports began to expand rapidly, climbing to a record \$1,028 million in 1981. In the subsequent two years, a depressed world market and a strong dollar drove exports down 61% to \$406 million in 1983. After a modest gain in 1984, exports expanded at an annual average rate of 17% to \$650 million in 1987. The dollar's significant decline since 1986 against major foreign currencies bodes well for exports in 1988.

Twenty-five years ago imports represented only 4% of U.S. machine tool consumption but since that time growth has been phenomenal. In 1971 imports were \$90 million, a cyclical low. By 1981 imports had reached a cyclical peak of \$1,431 million yielding an average annual growth rate of 32% since 1971. Between 1981 and 1983 U.S. machine tool consumption fell 55%, but as a result of the dollar's appreciation, imports declined only 36%. When machine tool demand rose in 1984, imports climbed 50% while exports grew by less than 1%, and the negative trade balance ballooned. The annual machine tool trade deficits for 1986 and 1987 were \$1.7 billion and \$1.4 billion, respectively. These deficits underscore the intensity of the international competitive pressures being felt by U.S. machine tool builders and bring into focus the reality of the world machine tool marketplace. Reestablishing its position in this world market is vital to the future of the U.S. machine tool industry.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

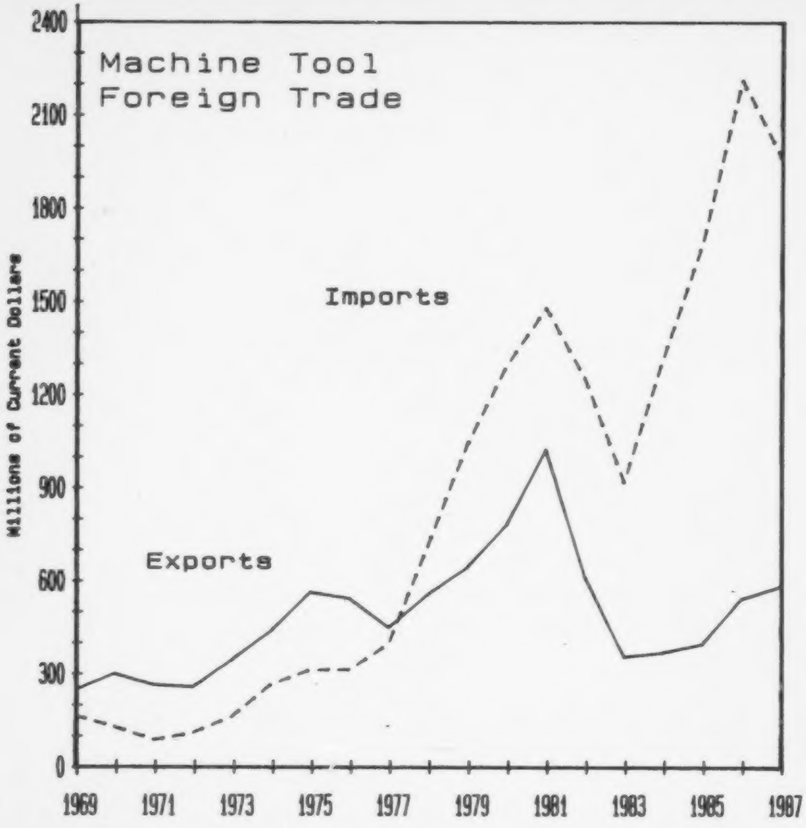
While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value, or price, in the foreign country at the time of exportation and include the cost of containers, coverings, and other expenses incidental to shipping the merchandise to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

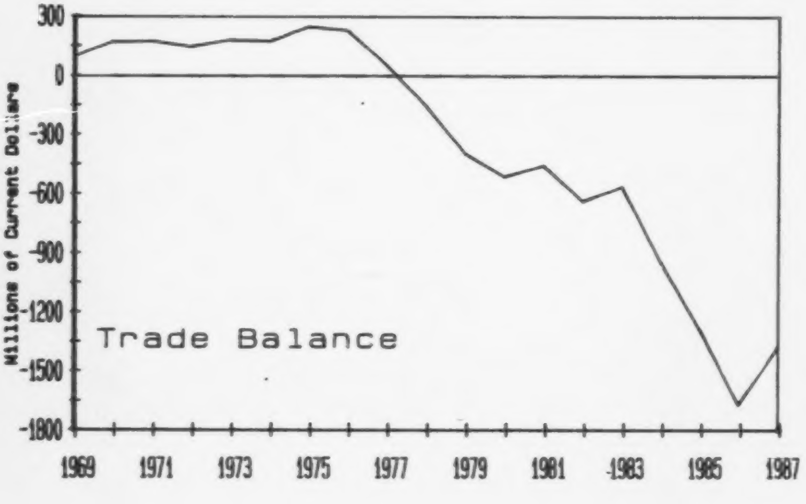
As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

There are two additional export series with a more limited scope but considered more accurate by the industry. The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry. The second is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce. This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward. For details on these two reports, see Chapter 4.

The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on exports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA import and Schedule B export classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data, permitting the calculation of U.S. consumption of machine tools for a variety of product types.


Machine Tool
Foreign Trade
Imports
Exports
Millions of Current Dollars
2400
2100
1800
1500
1200
900
600
300
0
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987


Trade Balance
Millions of Current Dollars
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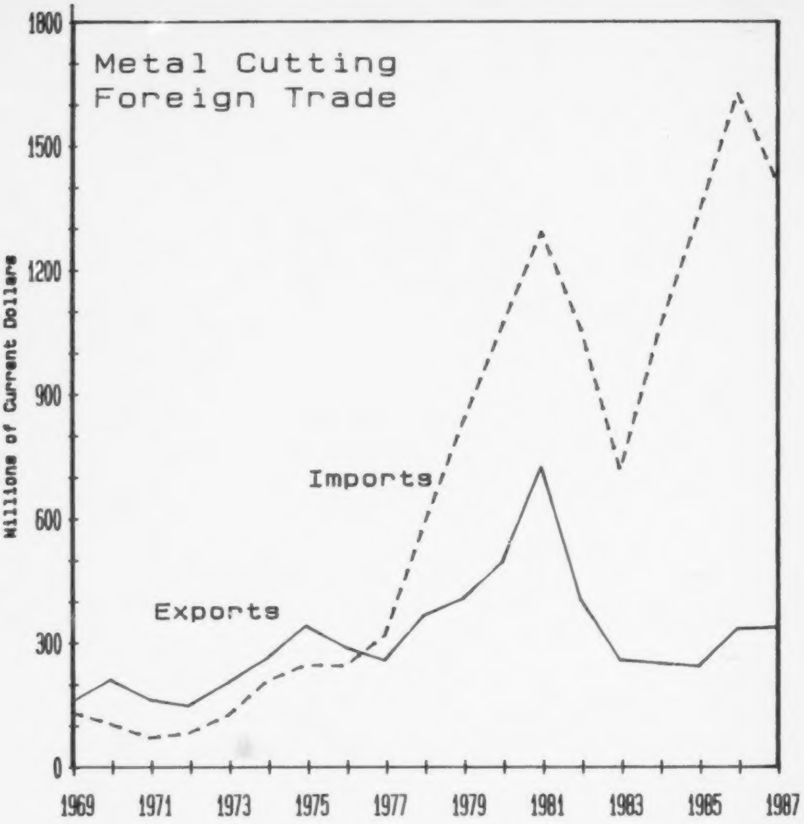
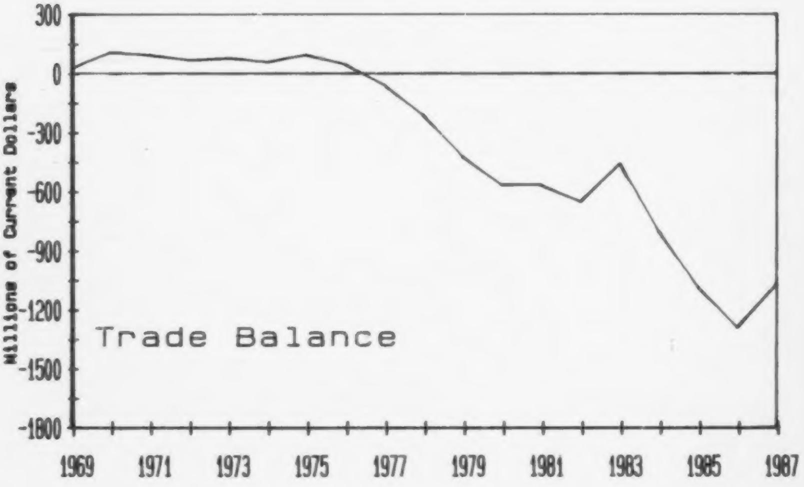
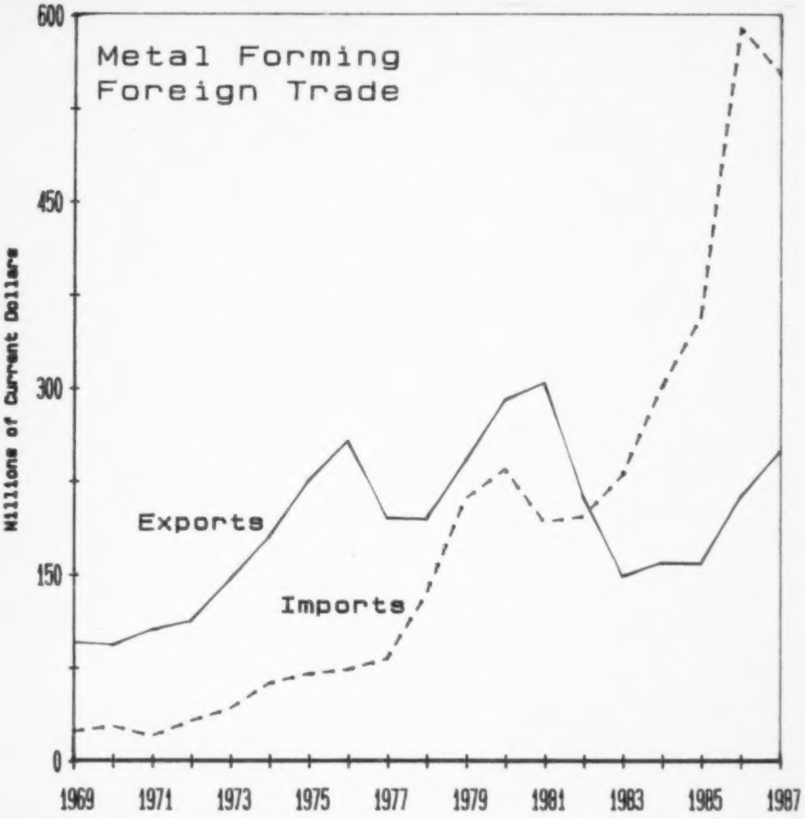
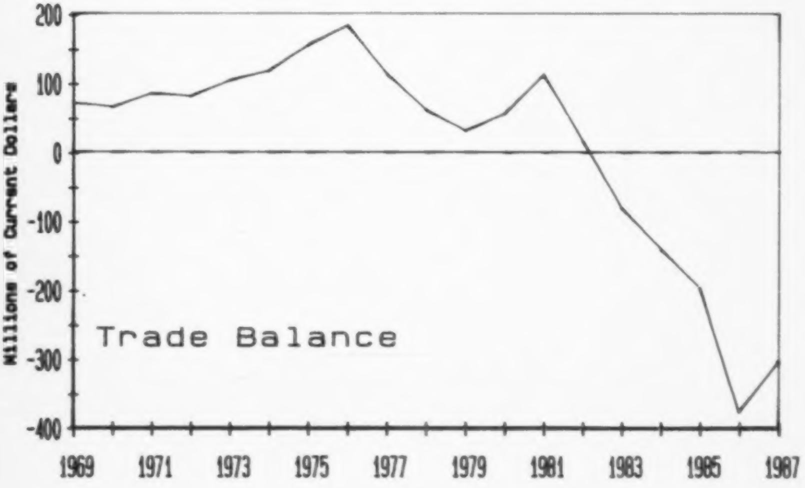
0
-300
-600
-900
-1200
-1500
-1800
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987


Metal Cutting
Foreign Trade
Imports
Exports
Millions of Current Dollars
1800
1500
1200
900
600
300
0
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987


Trade Balance
Millions of Current Dollars
300
0
-300
-600
-900
-1200
-1500
-1800
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987


Metal Forming
Foreign Trade
Exports
Imports
Millions of Current Dollars
600
450
300
150
0
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987


Trade Balance
Millions of Current Dollars
200
100
0
-100
-200
-300
-400
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION

By Type of Complete Machines Valued Over $2,500, 1979 to Date

Machine Classification	1979	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
Machine Tools	22.6	23.3	24.9	26.4	33.7	37.9	41.4	49.4	48.7
Metal Cutting	23.0	23.6	26.1	27.4	33.6	39.3	43.3	48.7	48.1
Boring Machines	26.0	25.0	29.3	25.2	29.4	31.9	39.4	61.5	44.4
Drilling Machines	18.8	15.7	21.7	33.3	31.6	50.9	53.6	72.7	53.9
Gear Cutting Machines	32.9	29.8	31.1	28.1	36.7	41.9	39.5	60.1	73.4
Grinding Machines	NA	23.4	22.6	22.6	28.9	30.1	29.9	35.3	40.1
Lathes	37.3	36.0	41.3	45.9	38.6	51.5	57.7	69.9	61.0
Milling Machines	24.5	30.2	23.9	26.5	28.5	34.8	45.4	45.7	31.8
Machining Centers	11.3	20.8	31.3	36.9	49.3	56.0	63.0	66.1	64.6
Metal Forming	21.1	22.1	19.4	22.5	33.8	33.7	35.8	51.2	50.2
Punching & Shearing Machines	NA	23.3	25.7	34.6	27.5	44.9	40.0	48.0	33.2
Bending & Forming Machines	NA	17.5	16.3	20.7	24.5	27.0	35.2	49.4	38.5
Presses	NA	16.0	11.6	12.4	29.3	27.2	28.5	50.9	59.1
Forging Machines	NA	28.5	21.5	25.3	49.8	55.3	33.3	134.0	57.4
Total NC Machines	NA	23.4	32.7	35.1	38.4	50.3	55.1	60.8	55.2

NA - Not Available. p - Preliminary. r - Revised.

Sources: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery", and U.S. Bureau of the Census, "IM 146" and "EM 522."

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF NEW COMPLETE MACHINE TOOLS (a), 1965 to Date

(Thousands of Dollars)

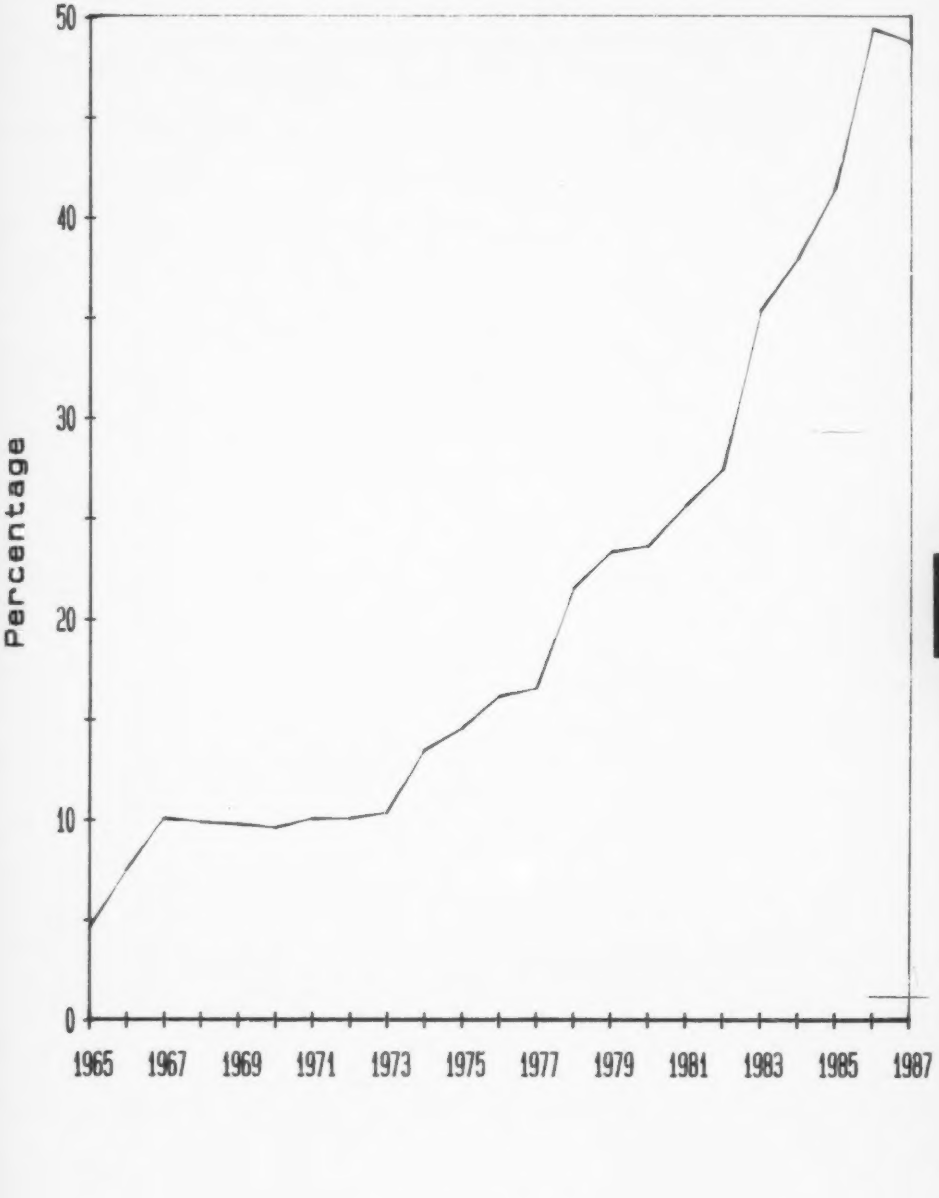
Year	Production	Exports	Imports	Domestic Consumption
1965	$1,429,650	$222,437	$ 56,293	$1,263,506
1966	1,680,014	208,909	117,748	1,588,853
1967	1,826,432	224,672	178,205	1,779,965
1968	1,722,727	216,552	163,576	1,669,751
1969	1,692,188	242,427	156,122	1,605,883
1970	1,551,777	292,086	131,826	1,391,517
1971	1,057,870	251,532	90,085	896,423
1972	1,269,302	238,135	113,998	1,145,165
1973	1,787,850	325,494	167,057	1,629,413
1974	2,165,937	410,510	270,740	2,026,167
1975	2,406,082	536,659	317,578	2,187,001
1976	2,178,265	514,942	318,304	1,981,627
1977	2,453,423	426,729	400,904	2,427,598
1978	3,142,594	533,094	715,282	3,324,782
1979	4,064,045	619,111	1,043,768	4,488,702
1980	4,812,349	734,135	1,259,802	5,338,016
1981	5,111,253	949,553	1,431,457	5,593,157
1982	3,804,250	574,567	1,217,718	4,447,401
1983	2,144,849	359,037	921,083	2,706,895
1984(r)	2,426,382	373,457	1,318,964	3,371,889
1985(r)	2,682,201	400,453	1,688,693	3,970,441
1986(r)	2,747,881	546,610	2,217,050	4,418,321
1987(p)	2,584,999	586,748	1,968,855	3,967,106

p - Preliminary. r - Revised.

(a) These figures reflect data for machine tools of all values but do not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W," U.S. Department of Commerce Trade Statistics.

U.S. Machine Tool Imports as a Percentage of U.S. Machine Tool Consumption



U.S. IMPORTS OF MACHINE TOOLS (a)

Major Countries of Origin, 1976 to Date

(Millions of Dollars)

Country of Origin	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
TOTAL	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9	$1,253.3	$946.5	$1,356.6	$1,738.5	$2,251.8	$1,995.4
Austria	2.0	1.0	2.3	3.7	2.3	2.1	15.8	30.0	4.2	7.5	7.5	16.4
Belgium	3.1	4.9	8.0	12.6	16.7	18.5	9.1	7.1	6.7	10.3	12.7	9.4
Czechoslovakia	3.5	2.9	3.9	4.6	5.7	4.7	2.0	.6	1.7	.5	.5	.7
Denmark	1.0	.7	2.5	3.3	3.7	2.9	2.2	2.8	5.2	4.7	4.1	2.6
France	9.5	9.7	17.4	21.4	24.9	26.5	12.9	10.5	13.9	19.2	36.9	17.6
Germany (East)	.8	.7	1.8	1.9	2.0	2.9	3.1	2.1	1.5	1.4	1.8	1.1
Germany (West)	93.3	91.2	154.8	197.0	235.9	192.3	204.6	125.7	205.7	248.9	367.9	332.0
Italy	14.6	15.1	25.4	37.5	44.1	42.9	45.0	49.3	51.3	76.6	129.8	72.4
Netherlands	1.1	1.9	2.7	5.5	6.1	4.9	2.6	5.7	9.0	11.2	19.7	9.1
Poland	2.8	7.2	12.8	19.2	15.6	15.8	7.5	2.1	1.0	2.2	1.5	1.4
Spain	6.9	7.7	13.4	20.6	27.1	24.3	20.6	11.6	16.2	19.8	23.1	16.5
Sweden	8.4	11.5	18.3	31.3	29.3	28.3	23.4	15.3	19.2	29.0	22.6	23.6
Switzerland	28.6	35.3	57.6	66.0	81.5	78.4	71.8	54.7	78.4	95.2	115.3	103.6
United Kingdom	32.0	46.1	74.9	96.9	117.3	136.1	107.5	66.4	74.7	93.5	100.7	85.4
Canada	14.9	19.2	27.0	34.2	47.9	44.0	36.6	29.4	40.8	61.2	52.9	49.2
Brazil	.7	.9	1.9	5.9	7.2	9.9	9.3	6.8	5.0	21.5	19.2	7.3
Japan	67.3	105.7	220.6	353.3	492.0	687.5	529.2	414.9	683.3	854.1	1,173.6	1,061.2
Korea, Republic of	(b)	(b)	1.0	5.7	7.7	14.6	18.7	9.8	8.8	9.0	10.9	14.7
Singapore	2.5	3.5	5.1	12.2	13.1	14.1	11.6	4.4	7.1	15.9	7.3	9.3
Taiwan	13.0	22.6	48.8	85.7	93.6	102.4	90.9	83.4	99.2	134.2	119.3	127.5
Other Countries	12.3	13.1	14.9	25.3	24.8	29.8	28.9	13.9	23.7	22.5	24.5	34.3

(a) Data does not include parts, but does include "Used and Rebuilt."
(b) Included in "Other Countries."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."

U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS (a)

Major Countries of Origin, 1976 to Date

(Millions of Dollars)

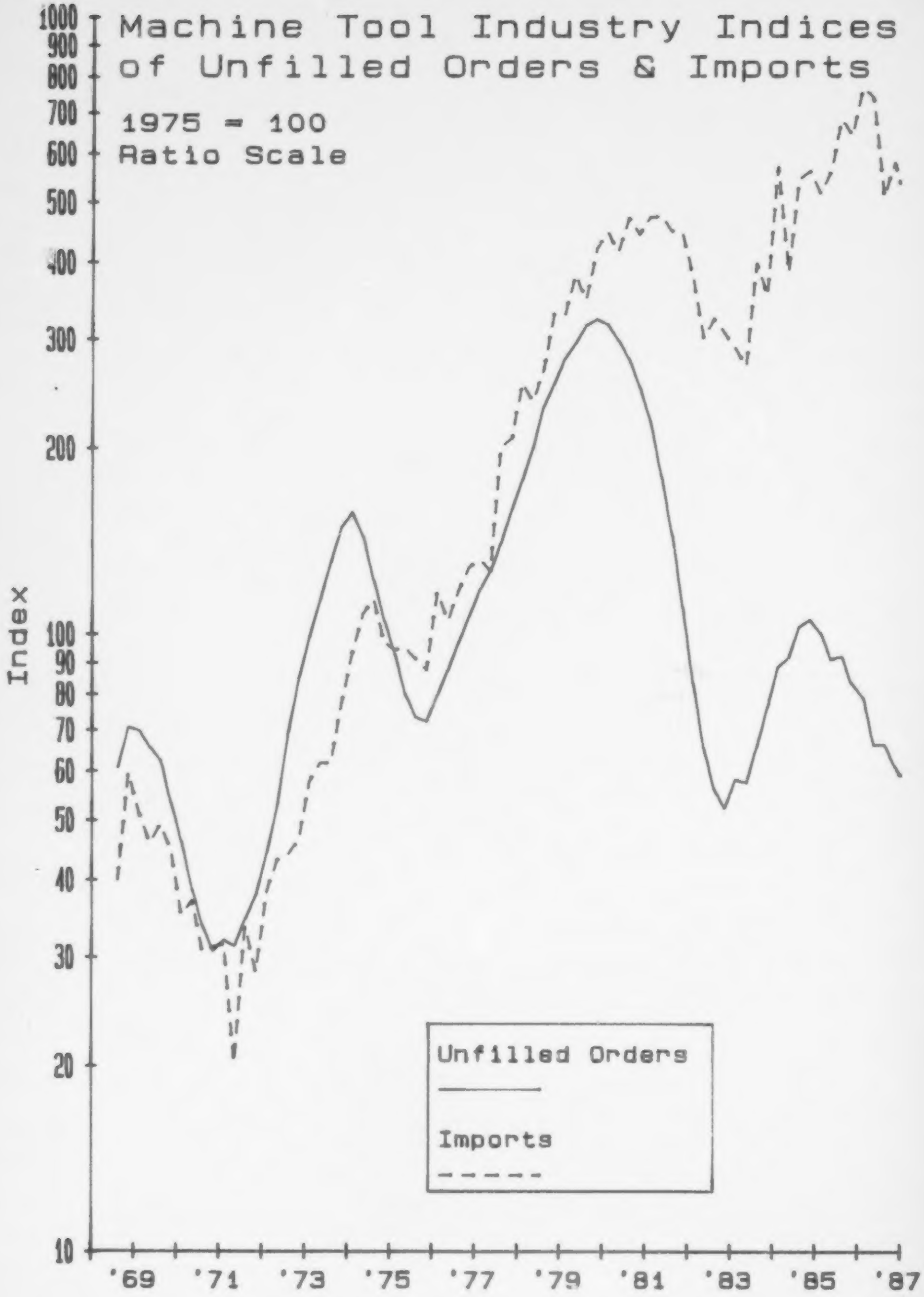
Country of Origin	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
CUTTING TOTAL	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5	$1,057.4	$716.9	$1,056.7	$1,374.7	$1,654.6	$1,435.9
Austria	1.9	1.0	1.8	2.6	1.4	2.0	3.1	4.2	2.6	6.2	6.6	9.4
Belgium	1.2	4.3	4.5	6.2	8.0	10.8	5.6	3.0	.5	3.4	3.0	1.5
Czechoslovakia	3.5	2.9	3.9	4.4	5.5	4.6	2.0	.6	1.7	.5	.5	.7
Denmark	.9	.5	1.8	1.5	2.4	1.3	1.2	1.4	2.8	2.8	2.5	1.7
France	7.8	9.7	13.8	17.5	22.3	20.6	9.3	6.6	8.5	12.7	27.3	13.8
Germany (East)	.7	.7	1.6	1.8	1.9	2.9	3.1	2.0	1.5	1.3	1.1	1.0
Germany (West)	59.7	60.3	104.0	117.0	150.2	148.4	155.0	91.6	137.1	186.7	279.6	268.0
Italy	11.3	11.1	19.6	23.9	34.2	31.6	36.5	21.4	38.5	45.3	92.3	45.6
Netherlands	1.0	1.0	2.4	4.3	5.4	4.3	2.1	2.6	5.9	7.4	17.1	6.4
Poland	2.8	7.2	12.6	19.1	15.5	15.8	7.5	2.0	1.0	2.2	1.5	1.4
Spain	6.2	7.3	13.0	18.9	24.3	21.9	19.0	9.5	13.6	17.9	19.4	14.2
Sweden	7.0	9.6	12.9	21.7	19.9	19.9	14.9	7.7	11.9	15.3	11.0	16.3
Switzerland	22.5	28.1	47.7	53.9	65.9	65.4	61.1	40.5	66.1	76.3	96.6	81.1
United Kingdom	27.8	39.2	64.0	86.7	103.8	120.5	94.1	56.6	60.8	67.1	77.4	68.7
Canada	8.9	11.0	16.2	18.1	29.1	28.2	22.4	12.7	17.2	30.4	23.3	19.1
Brazil	.7	.9	1.8	5.9	7.1	9.8	9.0	6.5	4.3	7.7	4.2	2.3
Japan	54.8	89.1	193.7	305.9	433.4	627.4	467.8	340.0	550.6	721.4	841.8	721.3
Korea, Republic of	(b)	(b)	.9	5.6	7.7	14.5	18.3	9.8	8.8	8.9	10.8	14.3
Singapore	2.5	3.5	5.1	12.2	13.1	14.0	11.6	4.2	6.7	15.6	6.9	7.5
Taiwan	12.8	22.5	47.9	85.3	93.1	101.6	89.9	82.4	97.3	130.4	116.1	123.0
Other Countries	11.3	9.3	12.[illegible]	20.6	20.2	26.0	23.9	11.4	19.0	15.2	15.6	18.3
FORMING TOTAL	$69.4	$73.0	$81.7	$210.7	$234.1	$191.4	$196.0	$229.5	$299.9	$363.8	$597.2	$559.5
Austria	1.6	.1	(b)	1.1	9	.1	12.8	25.7	1.5	1.3	.9	7.0
Belgium	3.8	1.9	.5	6.4	8.7	7.7	3.5	4.1	6.2	6.9	9.8	7.9
Germany (West)	27.0	33.6	30.9	80.1	85.7	44.0	49.6	34.1	68.6	62.2	88.3	63.9
France	1.4	1.7	2.4	4.0	2.5	5.9	3.6	3.9	5.4	6.5	9.6	3.8
Italy	4.2	3.2	4.0	13.6	9.9	11.3	8.6	27.9	12.8	31.3	37.5	26.8
Sweden	2.4	1.4	2.0	9.6	9.3	8.3	8.5	7.6	7.3	13.7	11.6	7.3
Switzerland	6.1	6.2	7.2	12.1	15.7	13.0	10.7	14.2	12.3	18.9	18.7	22.6
United Kingdom	5.1	4.2	6.9	10.2	13.6	15.6	13.5	9.8	13.9	26.5	23.3	16.7
Canada	6.5	6.0	8.3	16.1	18.8	15.8	14.2	16.7	23.5	30.8	29.6	30.1
Japan	9.5	12.5	16.6	47.4	58.6	60.1	61.5	74.9	132.7	132.7	331.8	339.9
Other Countries	1.8	2.2	2.9	10.1	10.4	9.6	9.5	10.6	15.6	33.0	36.1	33.4

(a) Data does not include parts, but does include "Used and Rebuilt."

(b) Included in "Other Countries."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."



Machine Tool Industry Indices of Unfilled Orders & Imports

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS
By Machine Classification, 1976 to Date
(Millions of Dollars)

Machine Classification	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GRAND TOTAL	$383.3	$482.2	$832.4	$1,269.5	$1,556.9	$1,712.9	$1,489.4	$1,100.2	$1,652.7	$2,110.2	$2,682.9	$2,412.3
METAL CUTTING	293.6	386.7	681.6	1,027.6	1,282.2	1,485.1	1,258.1	836.9	1,316.5	1,685.6	2,015.3	1,803.0
Complete Machines (a)	245.3	319.2	582.2	833.1	1,029.2	1,245.6	1,025.7	697.0	1,025.1	1,332.3	1,627.8	1,416.1
Gear Cutting or Hobbing	16.9	13.5	25.9	28.4	29.4	37.0	25.8	13.8	18.1	20.5	32.6	50.0
Drilling	15.3	19.6	16.7	25.0	27.2	26.4	20.7	9.9	17.9	32.6	39.1	29.1
Milling	25.9	27.9	47.7	83.1	138.1	124.7	87.7	52.5	83.4	133.7	113.8	87.4
Machining Centers	(b)	(b)	22.0	39.6	93.4	195.7	168.9	164.9	248.0	330.0	361.8	313.4
Boring and Vertical Turret Lathes	41.0	51.8	65.9	70.7	76.9	86.7	78.8	44.6	49.7	50.4	119.6	82.0
Lathes (Exc. Vertical Turret Lathes)	77.0	113.9	219.4	353.6	380.0	479.8	338.6	165.7	268.1	350.3	391.1	331.5
Grinding	32.2	39.2	68.1	85.2	150.5	137.2	117.6	89.6	118.5	147.9	190.0	177.6
Other	37.1	53.3	63.6	82.4	84.4	87.2	98.7	72.8	129.4	169.8	278.8	245.8
Metal Cutting, $2,500 and Under	(c)	(c)	50.9	65.1	50.0	70.9	68.9	83.2	91.8	97.1	101.0	99.1
Used and Rebuilt	(c)	(c)	(c)	(c)	35.2	45.9	31.7	19.9	31.6	42.5	26.8	19.8
Parts	48.3	67.5	99.5	194.5	217.8	193.6	200.7	120.0	259.8	310.9	360.7	367.1
METAL FORMING	89.7	95.5	150.7	241.9	274.7	227.8	231.3	263.3	336.1	424.5	667.6	609.3
Complete Machines (a)	73.0	81.7	133.1	210.7	230.6	185.9	192.0	224.1	293.9	356.4	589.3	552.8
Metal Forming, $2,500 and Under	(c)	(c)	4.1	4.5	3.9	4.5	4.6	5.2	8.1	9.2	10.1	9.7
Used and Rebuilt	(c)	(c)	(c)	(c)	3.5	5.5	3.9	5.5	6.0	7.4	7.9	6.7
Parts	16.7	13.8	17.6	31.2	40.6	36.3	35.4	33.8	36.3	60.7	70.4	49.8

(a) Excludes "Used and Rebuilt."

(b) Included in "Other Metal Cutting Machine Tools."

(c) Included in respective machine classifications.

Note: Individual items may not add to totals due to rounding. This table is based on a set of classifications which was expanded in 1978 and again in 1980. A separate table on the following page reports import data for 1986 and 1987 using the more detailed machine tool categories.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146."

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1986 and 1987
(Values in Thousands of Dollars)

Machine Classification	1986		1987	
	Units	Value	Units	Value
GRAND TOTAL	904,891	$2,015,280(a)	1,124,000	$1,803,014(a)
Complete New Machines	898,765	$1,627,796	1,119,329	$1,416,080
Gear Hobbers	73	9,149	89	14,510
Gear Shapers	5	764	50	6,481
Gear Cutting Machines, N.E.C.	21	3,101	35	2,488
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	2,220	171,305	1,529	127,129
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	328	31,566	191	17,493
Horizontal Machining Centers, ATC, NC	715	89,382	723	113,747
Machining Center, NC, N.E.C.	774	69,504	471	55,058
Single Station and Multi-Station Transfer Machines	92	32,534	102	22,279
Way Type Machines (Unit Heads)	0	0	3	179
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	7	1,337	9	3,699
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	47	10,769	61	17,479
Vertical Boring-Drilling-Milling Machines, NC	245	19,034	163	13,591
Horiz. Boring-Drilling-Milling Machines, non-NC	23	1,683	36	2,701
Vertical Boring-Drilling-Milling Machines, non-NC	97	2,916	233	6,261
Drilling Machines, NC	144	10,866	159	7,621
Drilling Machines, Multi-Spindle, non-NC	60	4,741	71	2,220
Drilling Machines, Radial, non-NC	245	2,094	183	1,071
Drilling Machines, Upright, Single Spindle, non-NC	111	776	71	680
Drilling Machines, non-NC, N.E.C.	706	20,605	727	17,549
Milling Machines, NC	804	57,295	643	41,285
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	22	1,214	15	864
Milling Machines, Knee Type, non-NC	3,530	19,920	2,753	16,625
Milling Machines, Bed Type, non-NC	333	6,664	214	6,447
Milling Machines, non-NC, N.E.C.	1,862	28,678	1,141	22,141
Vertical Boring Machines, incl. VTL's NC	78	10,636	27	5,654
Vertical Boring Machines, incl. VTL's, non-NC	210	4,419	90	2,452
Boring Machines, NC, N.E.C.	26	10,669	44	5,921
Boring Machines, non-NC, N.E.C.	507	58,150	357	24,218
Horizontal Lathes, Multi-Spindle, NC	42	4,214	116	12,875
Horizontal Lathes, Single Spindle, Less Than 25 HP, NC	3,741	158,022	3,006	172,050
Horizontal Lathes, Single Spindle, 25-50 HP, NC	911	63,266	417	44,610
Horizontal Lathes, Single Spindle, Over 50 HP, NC	292	23,889	157	12,767
Horizontal Engine & Toolroom Lathes, non-NC	3,941	32,288	3,039	23,843
Automatic Chucking Lathes, Single Spindle, non-NC	113	3,550	84	3,069
Automatic Chucking Lathes, Multi-Spindle, non-NC	130	12,064	37	5,170
Automatic Bar Machines, Single Spindle, non-NC	57	1,890	52	2,472
Automatic Bar Machines, Multi-Spindle, non-NC	20	3,063	46	2,229
Horizontal Lathes, non-NC, N.E.C.	232	10,014	193	2,842
Vertical Lathes, Multi-Spindle, NC	171	12,259	103	7,557
Vertical Lathes, NSPF, NC	461	29,558	219	21,702
Vertical Lathes, excl. VTL's, non-NC	1,656	37,037	988	20,333
Gear Tooth Grinding & Finishing Machines	458	19,607	335	26,541
Tool & Cutter Grinding Machines, NC	107	4,923	48	2,392
Tool & Cutter Grinding Machines, non-NC	1,269	20,135	1,030	19,225
Honing & Lapping Machines	246	14,196	305	13,078
Grinding Machines, Flat Surface, NC	50	8,336	45	4,280
Grinding Machines, Flat Surface Reciprocating Table, non-NC	415	6,147	312	4,881
Grinding Machines, Flat Surface, non-NC, N.E.C.	1,607	29,810	2,048	27,564
Grinding & Polishing Machines, NC, N.E.C.	116	13,245	167	30,744
External Grinding Machines, non-NC	811	19,836	259	10,277
Internal Grinding Machines, non-NC	107	5,458	27	2,553
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	194	9,757	107	8,201
Grinding Machines, non-NC, N.E.C.	1,689	58,118	1,537	54,414

Footnotes at the end of Table.

(Continued)

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1986 and 1987

(Values in Thousands of Dollars)
(Continued)

Machine Classification	1986		1987	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	867	$ 58,266	626	$ 42,539
All Other Electrical Discharge Machines	542	24,640	377	18,710
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	65	4,975	114	16,233
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	202	5,542	232	7,888
Metal Cutting Machine Tools, NC, N.E.C.	192	92,097	122	70,810
Sawing & Cut-off Machines, non-NC	1,988	30,702	1,527	17,956
Broaching Machines, non-NC	68	1,746	88	4,504
Metal Cutting Machine Tools, non-NC, N.E.C.	1,159	28,272	1,360	44,250
Metal Cutting Machine Tools, Less Than $2,500	861,561	100,968	1,090,016	99,106
Metal Cutting Machine Tools, Used or Rebuilt	6,126	26,780	4,671	19,813
Parts	—	360,704	—	367,121

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1986 and 1987

(Values in Thousands of Dollars)

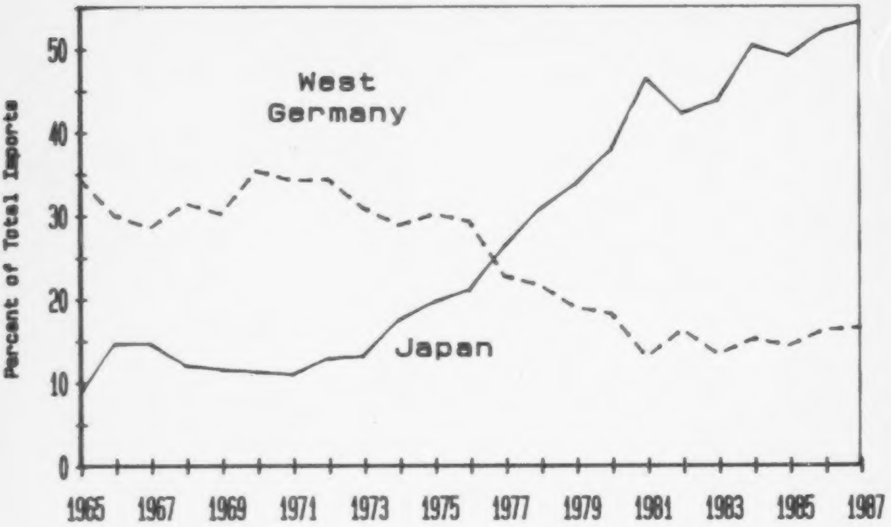
Machine Classification	1986		1987	
	Units	Value	Units	Value
GRAND TOTAL	36,085	$667,637(a)	35,657	$609,301(a)
Complete New Machines	35,586	$589,254	35,126	$552,775
Die Casting Machines	705	27,906	448	19,686
Punching & Shearing Machines, incl. Combination, NC	483	55,352	319	42,282
Shearing Machines, non-NC	1,082	21,028	725	15,464
Punching & Combination Punching & Shearing Machines, non-NC	683	12,039	572	9,384
Bending, Folding, Straightening & Flattening Machines, NC	394	35,158	224	16,905
Press Brakes, non-NC	1,083	30,114	654	17,206
Bending Rolls, Ram & Press Bending Machines, non-NC	202	2,790	125	1,691
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	1,288	34,589	1,124	25,518
Metal Forming Machine Tools, NC, N.E.C.	60	22,378	116	22,453
Mechanical Presses, non-NC	381	58,458	1,310	114,622
Hydraulic Presses, Vertical, Single Action, non-NC	84	7,733	262	43,084
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	946	166,750	614	125,021
Headers & Upsetters, non-NC	108	7,975	130	8,214
Forging Machines, non-NC, N.E.C.	145	9,974	173	12,841
Metal Forming Machine Tools, non-NC, N.E.C.	2,160	86,902	1,824	68,693
Metal Forming Machine Tools, Less Than $2,500	25,782	10,064	26,506	9,670
Metal Forming Machine Tools, Used or Rebuilt	499	7,943	531	6,712
Parts	—	70,440	—	49,814

N.E.C. - Not Elsewhere Classified.

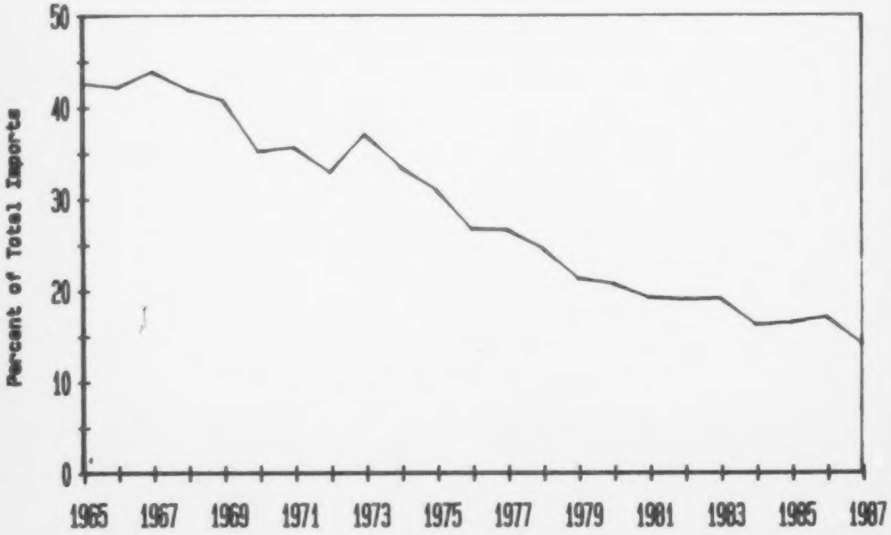
(a) The data may not add to totals due to rounding.

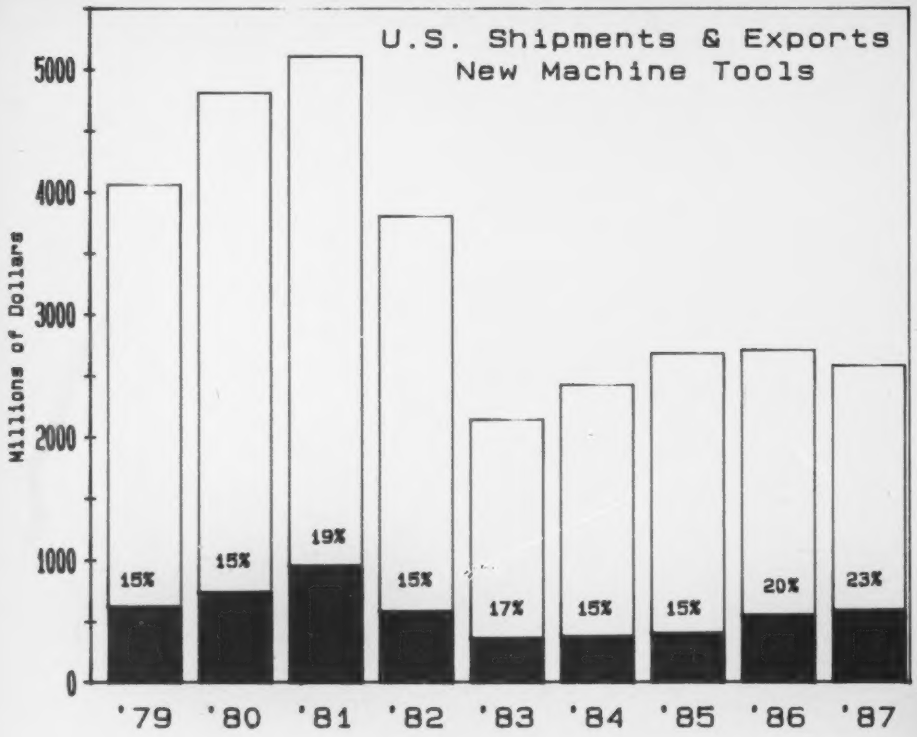
Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. Machine Tool Imports From West Germany and Japan

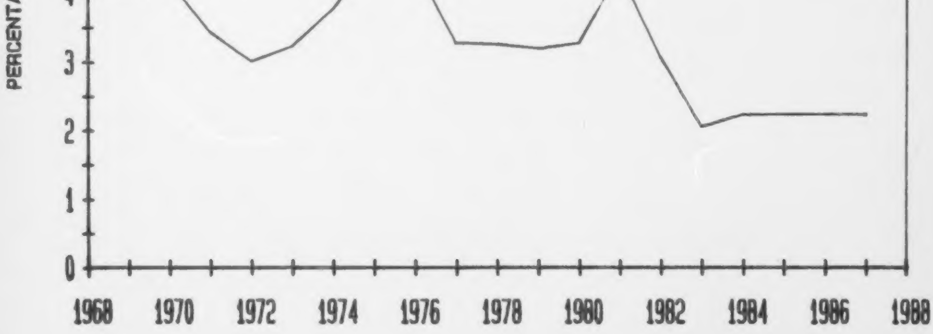


U.S. Machine Tool Imports from France, Italy, Switz. & the U.K.





U.S. MACHINE TOOL EXPORTS
Percent of World Machine Tool Consumption



U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1976 to Date

(Millions of Dollars)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GRAND TOTAL	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6	$615.0	$406.0	$409.3	$452.4	$590.3	$650.4
EUROPE	194.1	163.8	201.3	212.3	228.0	231.8	163.6	128.6	110.0	101.4	161.1	154.3
Austria	1.5	1.8	.3	.9	1.8	1.3	1.2	2.3	.2	.7	1.1	17.2
Belgium	5.0	7.8	8.7	4.1	3.6	4.9	2.9	1.5	4.3	2.3	23.5	12.6
Denmark	2.1	2.5	1.7	3.1	3.1	1.3	1.4	.4	.8	1.0	.4	1.1
Finland	2.0	.9	.6	1.9	1.5	1.8	6.3	1.1	.4	.8	.4	1.0
France	18.9	10.8	12.2	20.4	21.3	29.2	19.2	12.5	11.6	6.7	10.6	12.2
Germany, West	16.0	23.7	29.7	28.5	33.7	35.2	21.8	30.9	21.4	23.1	37.0	32.0
Greece	1.1	.5	1.2	4.5	1.1	1.4	1.6	.3	.3	.3	.1	.1
Ireland	1.5	1.0	2.0	2.9	3.5	11.4	4.2	4.5	4.0	2.2	2.2	2.0
Italy	13.8	13.5	11.0	17.5	13.4	16.7	14.9	15.5	6.8	11.2	16.8	16.0
Netherlands	3.6	4.5	4.8	5.3	7.8	7.4	3.3	2.7	2.0	2.9	3.5	4.6
Norway	1.7	4.1	1.5	2.3	1.9	1.0	.6	.3	.9	.7	.8	1.3
Poland	13.5	8.2	24.2	3.1	2.1	(a)	.3	2.0	.6	1.1	.7	4.0
Portugal	.7	.2	.3	.4	.4	2.1	.1	(a)	.3	.2	.2	1.1
Romania	1.6	4.8	21.0	6.6	3.3	1.5	3.3	(a)	0	0	0	.1
Spain	5.8	4.3	3.7	4.6	13.5	14.2	6.3	2.1	2.7	3.7	3.2	2.8
Sweden	13.2	10.2	6.7	4.0	11.0	5.5	5.0	2.7	4.1	3.6	5.8	6.4
Switzerland	2.8	3.2	4.3	6.2	12.5	9.2	7.1	5.3	5.3	3.6	6.4	5.7
United Kingdom	38.3	26.6	46.4	83.7	62.9	64.1	59.8	35.0	40.8	31.2	43.3	24.9
U.S.S.R.	48.1	31.4	16.7	7.3	25.8	16.5	1.3	7.5	.6	1.2	1.3	3.2
Yugoslavia	2.2	1.6	3.6	3.6	2.1	4.8	1.1	.7	.9	.5	1.6	1.6
All Other	.2	1.7	.4	.4	1.7	2.3	1.8	1.4	2.0	4.5	2.2	4.5
NORTH AND CENTRAL AMERICA	136.7	109.4	119.8	167.9	304.4	520.5	221.6	108.1	132.5	149.1	181.2	191.3
Canada	78.9	61.1	76.5	95.4	162.4	256.1	82.3	61.7	82.6	82.0	85.0	98.5
Mexico	52.9	42.0	36.9	67.7	135.7	258.9	135.9	42.5	45.7	63.8	93.9	89.1
All Other	4.1	5.1	5.4	4.8	6.3	5.5	3.3	3.8	4.2	3.4	2.3	3.8
SOUTH AMERICA	116.6	73.8	75.3	89.5	64.5	62.1	51.5	18.4	33.6	37.2	29.1	47.4
Argentina	4.3	3.2	10.8	8.0	13.8	7.7	8.2	1.9	3.7	1.1	1.2	2.5
Brazil	86.5	40.5	31.2	23.8	19.2	24.2	21.0	10.9	18.5	24.6	16.5	24.9
Chile	1.3	1.1	1.2	2.3	2.3	2.2	2.0	.3	1.8	.1	1.7	1.1
Colombia	1.3	4.8	3.1	4.1	5.6	4.6	3.4	1.7	3.2	3.8	1.8	3.3
Ecuador	1.5	2.4	2.5	4.0	1.6	3.9	1.3	.4	.5	.1	.4	.9
Peru	2.1	1.0	.3	1.7	2.2	3.5	.9	.1	.4	.3	1.1	.8
Venezuela	19.2	20.2	25.5	45.2	18.9	15.1	14.3	2.9	5.3	7.0	6.5	13.6
All Other	.4	.6	.7	.4	.9	.9	.3	.1	.2	.1	(a)	.3

Footnotes at the end of Table.

(Continued)

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1976 to Date

(Millions of Dollars)

(Continued)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ASIA	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6	$141.5	$131.6	$116.1	$138.0	$206.6	$238.8
China	(a)	(a)	6.0	9.3	6.7	1.5	2.4	16.6	13.0	26.6	50.5	42.5
Hong Kong	.7	1.2	2.3	1.6	4.0	10.2	2.5	2.2	3.1	4.5	2.2	4.1
India	2.5	4.2	6.9	4.4	9.7	15.2	15.4	5.4	6.4	6.6	9.9	5.7
Israel	3.9	3.9	4.1	10.9	12.4	7.7	6.8	7.0	8.2	5.4	5.0	2.3
Japan	27.0	22.1	39.0	48.3	59.1	54.2	51.0	35.7	39.4	36.2	52.1	55.4
Korea, Republic of	5.1	6.8	24.0	34.1	24.3	15.0	11.2	8.8	8.3	14.9	31.4	85.9
Philippines	1.8	1.5	1.4	2.6	3.3	3.2	5.2	2.0	1.3	1.2	.5	.8
Saudi Arabia	(a)	(a)	9.1	15.2	10.9	14.9	17.3	21.8	12.1	3.0	9.2	.9
Singapore	3.1	3.9	5.5	6.3	5.5	13.7	14.7	9.3	5.1	12.4	8.1	10.0
Taiwan	9.1	17.1	9.6	10.1	15.3	16.2	8.1	9.2	5.2	6.6	11.7	12.0
Turkey	1.0	.6	4.8	1.5	.4	1.4	1.2	3.4	6.7	6.8	18.4	12.2
All Other	25.0	26.2	26.6	7.5	7.2	10.3	5.8	10.2	7.4	13.9	7.5	7.0
OCEANIA	8.3	7.8	13.7	17.0	12.2	22.7	12.7	9.1	7.6	15.4	8.9	12.4
Australia	7.4	6.6	12.8	15.4	10.7	21.6	11.1	8.0	7.3	14.6	8.1	11.4
New Zealand	.8	1.1	.8	1.6	1.4	.7	1.4	1.0	.3	.7	.7	.9
All Other	.1	.1	.1	(a)	.1	.4	.1	.1	(a)	(a)	.1	.1
AFRICA	11.6	9.8	10.6	10.2	17.3	26.9	24.0	10.1	9.4	11.1	3.3	6.2
Egypt	.4	1.2	1.1	.9	2.5	6.3	3.9	2.2	4.0	2.7	.7	.9
South Africa	7.7	4.9	6.4	5.6	11.8	16.9	10.5	5.4	3.8	4.6	1.5	2.1
All Other	3.5	3.7	3.2	3.7	3.0	3.7	9.6	2.4	1.6	3.8	1.1	3.2

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1976 to Date
(Millions of Dollars)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GRAND TOTAL	$289.8	$257.7	$366.5	$408.0	$495.4	$724.0	$403.5	$258.3	$250.2	$285.9	$371.3	$383.5
EUROPE	115.4	103.7	143.7	144.7	150.0	153.6	112.1	84.4	71.4	64.6	107.3	101.4
Austria	1.2	1.3	.2	.8	1.4	1.2	1.0	1.9	.1	.6	.4	16.9
Belgium	2.8	5.5	5.5	2.2	.8	1.6	2.1	.8	3.3	1.4	20.9	11.5
Denmark	1.9	1.8	.9	1.3	1.3	.5	.8	(a)	.4	.8	.2	.8
Finland	1.3	.1	.6	1.8	1.4	1.3	2.4	.3	.1	.8	.1	.5
France	11.7	5.0	7.5	11.1	10.6	19.1	13.9	5.1	4.1	3.6	4.6	5.8
Germany, West	8.8	13.2	18.1	17.3	22.8	27.3	16.5	17.0	12.7	12.1	20.9	19.5
Greece	.6	.2	.9	1.4	.6	.3	.7	.1	.2	(a)	.1	(a)
Ireland	.7	.2	1.4	1.1	2.5	3.0	1.9	1.8	3.1	1.5	.9	.7
Italy	5.8	9.1	6.6	11.1	9.7	10.1	6.5	8.7	6.0	8.9	6.7	10.5
Netherlands	1.0	2.5	2.9	3.9	5.0	1.5	1.3	1.2	.7	1.7	2.4	1.8
Norway	1.5	3.9	1.0	1.8	.9	.7	.4	.1	.7	.3	.3	.3
Poland	4.5	3.9	19.4	2.7	2.1	(a)	.2	1.5	.5	.9	.4	3.6
Portugal	.1	.1	.2	.2	.3	1.6	.1	(a)	.1	.2	(a)	.2
Romania	1.4	4.8	20.9	1.3	2.3	1.4	1.2	(a)	0	0	0	.1
Spain	3.6	2.6	2.0	3.3	3.1	8.2	4.0	1.4	1.1	3.0	2.0	1.1
Sweden	11.6	9.1	5.7	3.2	7.5	3.5	2.2	1.5	3.6	3.2	2.9	3.2
Switzerland	2.3	2.4	3.7	5.3	8.9	7.8	5.4	5.2	2.0	2.6	4.9	3.9
United Kingdom	21.6	13.3	27.2	67.4	42.8	46.7	49.3	29.5	30.6	19.9	35.8	15.0
U.S.S.R.	31.8	23.0	15.5	4.6	23.6	15.1	1.2	7.4	.6	.4	1.0	2.1
Yugoslavia	.8	.7	3.4	2.4	1.1	1.8	.5	.6	.7	.3	1.1	1.4
All Other	(a)	.6	.3	.4	1.3	.9	.4	.1	.8	2.3	1.6	2.4
NORTH AND CENTRAL AMERICA	74.6	60.6	71.1	108.1	205.1	401.8	137.5	60.8	79.6	91.7	109.0	117.6
Canada	39.6	34.7	44.7	60.4	116.2	208.0	57.6	33.8	45.4	49.3	43.6	60.5
Mexico	33.4	23.5	23.0	44.8	86.2	190.8	78.0	24.6	31.4	40.3	63.8	54.9
All Other	1.5	2.1	2.8	2.9	2.7	3.0	1.9	2.4	2.8	2.1	1.7	2.2
SOUTH AMERICA	47.1	41.9	44.1	37.9	33.0	33.2	33.8	12.1	26.0	30.1	21.8	27.7
Argentina	2.1	2.0	6.6	3.7	6.5	4.3	6.0	1.1	2.0	1.1	.8	1.6
Brazil	34.9	28.0	25.5	18.5	14.6	14.7	16.2	8.0	17.4	20.9	14.3	15.6
Chile	1.0	.6	.4	.6	.9	1.3	.6	.2	1.6	.1	.7	.8
Colombia	.3	1.4	1.3	1.4	3.2	2.1	2.5	.9	2.3	2.2	1.5	2.4
Ecuador	.9	.6	1.3	1.3	.7	1.7	.5	.1	.5	.1	.3	.7
Peru	.5	.4	.2	.5	.6	.6	.8	(a)	.3	.3	.6	.7
Venezuela	7.2	8.6	8.6	11.5	5.9	7.9	7.0	1.6	1.8	5.5	3.6	5.7
All Other	.2	.3	.3	.3	.6	.6	.1	.1	.2	(a)	0	.2

Footnotes at the end of Table. (Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS

By Country of Destination, 1976 to Date

(Millions of Dollars)
(Continued)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ASIA	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9	$100.4	$92.7	$66.4	$91.5	$127.3	$129.0
China	(a)	(a)	4.6	8.8	3.9	1.3	2.0	13.1	10.1	21.7	34.8	22.1
Hong Kong	.5	.5	1.8	1.3	.9	1.8	1.5	1.6	2.3	3.1	1.9	2.3
India	1.9	2.3	4.1	3.4	7.0	10.4	11.7	4.2	2.8	4.4	7.7	4.5
Israel	2.5	3.1	3.0	6.3	4.3	5.3	4.0	3.0	2.8	3.6	2.4	1.9
Japan	15.6	12.1	30.9	31.1	38.6	40.8	36.6	30.1	23.8	20.1	35.8	29.3
Korea, Republic of	4.3	5.6	22.1	24.2	16.4	12.7	9.0	6.0	6.7	9.8	19.2	44.3
Philippines	1.1	.5	1.0	1.6	1.6	1.9	4.0	1.5	.1	.6	.3	.7
Saudi Arabia	(a)	(a)	3.9	7.4	4.7	8.0	8.3	9.0	2.6	2.1	.4	.6
Singapore	1.5	2.2	4.6	5.2	3.8	10.4	11.6	6.3	2.3	7.4	5.1	5.2
Taiwan	4.9	5.0	6.1	6.9	6.5	6.5	7.3	7.8	4.2	3.8	4.1	7.5
Turkey	.5	.5	4.5	1.5	.3	.9	.7	2.6	5.0	5.2	10.4	7.4
All Other	9.3	11.2	9.9	2.8	2.8	5.8	3.8	7.5	3.7	9.7	5.4	3.3
OCEANIA	4.8	3.7	6.3	9.8	5.5	15.9	6.7	4.0	2.2	4.5	4.2	6.1
Australia	4.2	3.2	5.8	8.6	4.9	15.3	6.1	3.2	2.0	4.0	3.9	5.9
New Zealand	.6	.5	.4	1.2	.5	.3	.6	.6	.2	.5	.2	.2
All Other	(a)	(a)	(a)	(a)	(a)	.3	.1	.1	(a)	0	.1	.1
AFRICA	5.8	4.8	4.8	6.9	10.8	13.5	12.8	4.2	4.5	3.4	1.5	1.6
Egypt	.2	.6	.4	.7	1.8	3.2	2.4	.7	2.0	1.4	.3	.3
Rep. of South Africa	3.8	3.1	3.4	4.7	7.8	8.5	7.8	2.8	1.5	.9	.6	1.0
All Other	1.8	1.1	.9	1.5	1.2	1.8	2.8	.8	1.1	1.0	.5	.3

(a) Less than $50,000 and/or included in "All Other."

NOTE: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS
By Country of Destination, 1976 to Date
(Millions of Dollars)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GRAND TOTAL	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6	$211.5	$147.7	$159.1	$166.5	$219.1	$266.9
EUROPE	78.7	60.1	57.7	67.6	78.1	78.2	51.4	44.3	38.6	36.8	53.8	52.9
Austria	.3	.5	.1	.1	.4	.1	.2	.4	.1	(a)	.7	.3
Belgium	2.2	2.3	3.2	1.8	2.9	3.2	.8	.7	1.0	.9	2.6	1.1
Denmark	.2	.7	.8	1.8	1.7	.8	.6	.3	.5	.2	.2	.3
Finland	.8	.7	(a)	.1	.1	.5	3.9	.8	.3	.1	.3	.4
France	7.2	5.8	4.7	9.3	10.6	10.0	5.3	7.4	7.5	3.1	6.1	6.4
Germany, West	7.2	10.5	11.6	11.1	10.9	7.9	5.3	13.9	8.8	10.9	16.1	12.5
Greece	.5	.4	.3	3.1	.6	1.1	.9	.3	.1	.2	(a)	.1
Ireland	.7	.8	.6	1.8	1.1	8.5	2.3	2.7	.8	.7	1.2	1.3
Italy	8.0	4.4	4.4	6.4	3.7	6.7	8.5	6.8	.8	2.3	10.1	5.4
Netherlands	2.6	1.9	1.9	1.5	2.8	5.9	2.0	1.5	1.4	1.2	1.1	2.8
Norway	.2	.3	.5	.5	1.0	.3	.2	.2	.2	.4	.5	.9
Poland	9.0	4.3	4.8	.4	(a)	0	(a)	.5	.1	.2	.3	.3
Portugal	.6	(a)	.2	.2	.2	.5	(a)	(a)	.2	(a)	.2	.9
Romania	.2	(a)	.1	5.3	1.0	.1	2.1	0	0	0	0	0
Spain	2.2	1.7	1.8	1.3	10.4	6.0	2.3	.6	1.4	.7	1.2	1.7
Sweden	1.5	1.1	1.1	.8	3.4	2.0	2.9	1.1	.6	.4	2.9	3.3
Switzerland	.5	.8	.6	.9	3.6	1.4	1.7	.2	3.3	1.0	1.5	1.8
United Kingdom	16.7	13.4	19.2	16.3	20.2	17.3	10.5	5.6	10.2	11.3	7.5	10.0
U.S.S.R.	16.3	8.4	1.2	2.7	2.2	1.4	.1	(a)	.1	.7	.2	1.0
Yugoslavia	1.5	.9	.1	1.3	1.0	3.1	.6	(a)	.2	.2	.5	.2
All Other	.2	1.1	.3	1.0	.1	1.4	1.5	1.3	1.2	2.2	.7	2.1
NORTH AND CENTRAL AMERICA	62.1	48.8	48.7	59.8	99.4	118.8	84.1	47.3	52.9	57.4	72.1	73.7
Canada	39.3	26.4	31.8	34.9	46.2	48.2	24.7	28.0	37.2	32.7	41.4	38.0
Mexico	19.5	18.5	13.9	22.9	49.5	68.1	57.9	17.9	14.4	23.5	30.1	34.1
All Other	2.6	3.0	2.6	2.0	3.7	2.5	1.5	1.4	1.4	1.2	.6	1.6
SOUTH AMERICA	69.5	31.9	31.2	51.7	31.6	28.8	17.7	6.3	7.6	7.1	7.4	19.7
Argentina	2.2	1.2	4.3	4.3	7.3	3.4	2.2	.8	1.7	.1	.4	.9
Brazil	51.6	12.5	5.7	5.3	4.7	9.5	4.8	3.0	1.1	3.8	2.3	9.3
Chile	.3	.5	.8	1.7	1.4	.9	1.4	(a)	.2	(a)	1.0	.4
Colombia	1.0	3.4	1.8	2.6	2.4	2.5	.9	.8	.9	1.6	.3	.9
Ecuador	.6	1.9	1.2	2.6	.9	2.2	.8	.3	.1	(a)	.1	.2
Peru	1.6	.6	.1	1.2	1.6	2.9	.1	.1	.1	.1	.5	.1
Venezuela	12.0	11.6	16.9	33.7	13.0	7.2	7.3	1.3	3.5	1.5	2.9	8.0
All Other	.2	.2	.4	.3	.3	.2	.2	(a)	.1	(a)	(a)	(a)

Footnotes are at the end of the Table. (Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1976 to Date

(Millions of Dollars)
(Continued)

Destination	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ASIA	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7	$41.1	$38.9	$49.6	$46.5	$79.3	$109.8
China	(a)	(a)	1.4	.5	2.8	.2	.4	3.6	2.8	4.9	15.7	20.4
Hong Kong	.2	.7	.5	.3	3.0	8.4	1.0	.6	.8	1.3	.3	1.8
India	.5	1.9	2.8	1.0	2.7	4.8	3.7	1.1	3.6	2.2	2.2	1.2
Israel	1.4	.7	1.1	4.6	8.1	2.4	2.8	4.0	5.4	1.9	2.6	.4
Japan	11.4	9.9	8.1	17.1	20.5	13.4	14.4	5.6	15.6	16.1	16.4	26.1
Korea, Republic of	.8	1.3	2.0	9.9	7.9	2.3	2.3	2.8	1.6	5.1	12.2	41.5
Philippines	.7	1.0	.4	1.0	1.7	1.3	1.2	.6	1.1	.6	.3	.2
Saudi Arabia	(a)	(a)	5.2	7.8	6.3	6.9	9.0	12.8	9.4	.9	8.8	.3
Singapore	1.6	1.7	.8	1.1	1.6	3.3	3.1	2.9	2.8	5.0	3.0	4.8
Taiwan	4.2	12.1	3.5	3.2	8.8	9.7	.8	1.4	.9	2.8	7.6	4.5
Turkey	.5	.1	.4	(a)	.1	.5	.5	.8	1.7	1.6	8.1	4.8
All Other	15.7	15.1	16.6	4.7	4.4	4.4	2.0	2.8	3.7	4.3	2.2	3.8
OCEANIA	3.6	4.1	7.5	7.2	6.7	6.7	5.9	5.1	5.5	10.9	4.7	6.2
Australia	3.3	3.4	7.1	6.8	5.8	6.2	5.0	4.7	5.3	10.6	4.3	5.5
New Zealand	.2	.5	.3	.4	.8	.4	.9	.4	.1	.3	.4	.7
All Other	.1	.1	.1	(a)	(a)	.1	.1	0	(a)	(a)	0	(a)
AFRICA	5.8	5.0	5.8	3.3	6.3	13.4	11.2	5.8	4.9	7.8	1.8	4.6
Egypt	.2	.6	.6	.2	.8	3.1	1.5	1.5	2.1	1.3	.4	.6
Rep. of South Africa	3.9	1.8	2.9	.9	4.0	8.3	2.7	2.7	2.3	3.7	.8	1.1
All Other	1.7	2.6	2.3	2.2	1.6	2.0	7.0	1.7	.5	2.8	.5	3.0

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1976 to 1985
(Millions of Dollars)

Machine Classification	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
GRAND TOTAL	$362.7	$321.4	$453.7	$544.9	$674.6	$974.2	$630.5	$430.8	$446.0	$494.8
Complete New Machines	273.8	247.2	353.0	392.5	462.8	668.6	375.6	230.6	223.5	242.5
Machining Centers, N.C.										
Vertical, A.T.C.	35.5	35.9	13.1	14.1	9.3	11.4	6.1	3.3	3.2	4.0
Horizontal, A.T.C.			18.2	28.5	24.3	27.0	19.1	4.2	10.5	8.0
Other			2.2	2.8	23.2	15.0	8.8	5.8	4.9	9.0
Vertical Boring-Drilling-Milling	(a)	(a)	.9	.9	8.2	42.1	4.6	6.1	4.8	5.4
Horizontal Boring-Drilling-Milling	5.8	11.4	9.1	14.4	5.8	12.9	8.9	2.9	4.5	7.5
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	8.1	6.6	6.6	10.6	13.6	18.7	14.5	5.7	5.9	4.5
Boring-Drilling-Milling, N.E.C.	2.4	2.2	5.0	6.5	5.5	5.7	4.4	3.9	2.4	6.0
Drilling, Vertical (Upright)	4.9	4.6	2.5	2.0	1.4	2.9	.8	2.5	.1	.3
Multiple Spindle	1.3	1.6	3.3	3.6	11.5	7.8	3.6	.7	4.9	1.8
Radial	1.6	1.1	1.6	1.3	1.9	2.0	1.3	1.2	.2	.5
Other	5.8	7.4	6.4	9.9	7.5	11.7	6.7	4.0	5.1	4.4
Gear Hobbers and Shapers (b)	1.6	.4	1.3	2.1	8.8	22.7	5.3	1.6	3.0	3.4
Gear Tooth Grinding & Finishing	7.9	3.8	12.8	4.4	14.0	18.1	9.2	3.3	5.3	3.4
Other Gear Cutting (g)	16.2	23.9	32.9	37.3	38.4	39.3	22.7	7.0	9.0	13.7
External Cylindrical Grinding	11.1	3.7	34.0	13.2	9.3	15.9	7.2	3.9	3.9	5.1
Surface Grinding	10.8	8.3	8.8	11.4	16.8	26.2	17.4	12.6	9.8	12.7
Tool and Cutter Grinding	7.1	7.3	6.8	5.7	9.2	9.5	6.5	5.1	2.8	8.4
Polishing and Buffing	1.0	.9	2.7	2.9	5.2	11.2	8.1	3.6	10.1	9.0
Honing and Lapping	7.0	3.3	4.3	3.8	3.9	9.5	3.3	2.9	2.4	3.4
Internal Cylindrical Grinding	6.9	3.7	4.9	5.9	7.8	5.1	4.3	1.4	1.7	2.0
Other Grinding and Polishing (c)	13.4	12.9	19.3	23.1	32.7	49.0	24.3	19.6	16.0	16.1
Engine Lathes	6.1	4.3	8.3	6.1	3.0	5.6	2.4	3.5	2.7	2.2
Turret Lathes (Excl. Vertical)	9.4	6.7	7.1	7.0	(f)	(f)	(f)	(f)	(f)	(f)
Automatic Chucking Lathes										
Single Spindle	7.6	4.2	7.7	12.4	5.6	7.5	2.3	2.7	3.0	.5
Multiple Spindle	2.8	4.6	3.4	4.9	3.6	4.3	2.3	1.0	4.8	1.2
Automatic Screw Machines	6.2	5.7	5.2	6.3	9.8	10.9	4.6	3.2	4.5	2.5
Other Lathes	15.3	16.8	11.9	16.3	45.1	61.8	58.8	24.5	24.5	45.5
Milling Machines										
Knee Type	3.2	4.5	4.0	3.4	1.1	.5	.8	1.5	.2	.1
Bed Type	1.7	2.9	11.9	2.8	2.8	2.0	.3	.1	.3	7.8
Profile, Dup. & Die Sinking	3.4	1.0	5.5	4.9	2.9	5.5	1.6	1.5	.3	.9
Other	6.0	12.9	9.1	12.3	12.4	29.8	19.6	10.8	21.9	10.5
Broaching	1.8	3.4	11.6	2.4	6.9	15.5	13.3	1.4	1.1	1.0
Planers, Other than Gear	.6	.7	1.5	1.6	(a)	(a)	(a)	(a)	(a)	(a)
Shapers and Slotters	1.0	.6								
Sawing and Cutoff	8.5	7.0	13.5	12.5	12.2	12.6	8.8	9.1	9.6	10.6
Tapping	3.4	1.6	1.9	1.9	(a)	(a)	(a)	(a)	(a)	(a)
Threading	2.5	4.5	4.2	9.9	(a)	(a)	(a)	(a)	(a)	(a)
Electrical Discharge	(a)	(a)	3.4	5.2	10.2	5.2	3.2	5.8	3.6	5.1
Single Station (Way Type)	(a)	(a)	.3	.4	51.7	97.2	36.4	21.1	5.2	4.3
Multi-Station	25.1	7.7	16.0	42.9						
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (d)	11.9	10.8	11.7	14.5	21.1	27.1	20.1	13.2	21.9	12.1
Less than $2,500, New (e)	8.9	8.3	17.9	20.5	15.9	19.0	13.7	10.3	9.5	9.6
Used and Rebuilt Machines	16.0	10.5	13.5	15.5	32.6	55.4	27.9	27.7	26.7	43.4
Parts	72.9	63.7	87.3	136.9	179.2	250.2	226.9	172.5	195.8	208.7

N.E.C. - Not Elsewhere Classified.

(a) Included in "Metal Cutting Machine Tools, N.E.C."
(b) "Gear Hobbers" for years prior to 1978.
(c) "Other Grinding" for years prior to 1978.
(d) "$1,000 and Over" for years prior to 1978.
(e) "Less than $1,000" for years prior to 1978.
(f) Included in "Other Lathes."
(g) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1976 to 1985

(Millions of Dollars)

Machine Classification	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
GRAND TOTAL	$320.0	$258.1	$284.9	$333.7	$424.6	$471.4	$371.9	$261.1	$289.0	$277.6
Complete New Machines	241.1	179.5	180.1	226.6	271.4	281.0	198.9	128.4	150.0	158.0
Punching and Shearing Machines	20.2	15.4	13.7	22.3	44.8	44.9	32.9	18.1	22.6	18.1
Bending and Forming Machines	26.0	25.5	39.2	45.7	44.5	46.0	35.1	19.7	19.4	30.3
Hydraulic and Pneumatic Presses	46.8	29.1	21.5	32.6	42.0	56.4	29.9	19.6	16.7	25.8
Mechanical Presses, O.B.I.	33.2	17.5	2.2	1.1	27.7	22.9	23.9	10.4	19.3	15.8
Other Mechanical Presses			8.6	18.1						
Headers and Upsetters	10.6	9.2	14.8	13.2	4.4	7.7	7.2	3.7	7.5	8.3
Forging Machines (except Presses)	3.0	4.2	6.2	7.0	12.0	13.6	8.1	4.2	4.2	3.9
Metal Container-making Machines	23.6	12.0	22.8	32.9	(c)	(c)	(c)	(c)	(c)	(c)
Metal Forming Machines, N.E.C.	6.5	8.1	44.7	46.5	92.4(d)	83.1(d)	57.6(d)	49.1(d)	57.2(d)	52.1(d)
Metalworking Machines, N.E.C., $2,500 and over (a)	67.0	54.2								
Metal Forming Mach. Tools under $2,500 (b)	4.2	4.3	6.4	7.2	7.1	6.1	4.2	3.7	2.9	3.5
Used and Rebuilt Machines	15.6	14.9	13.6	14.2	18.6	22.6	12.5	19.2	9.1	8.5
Parts	63.3	63.7	91.2	92.9	134.7	167.8	160.5	113.4	129.9	111.1

N.E.C. - Not Elsewhere Classified.

(a) "$1,000 and over" for years prior to 1978.
(b) "under $1,000" for years prior to 1978.
(c) Included in "Metal Forming Machines, N.E.C."
(d) From 1980 forward "Die Casting Machines & Parts" are included.

Sources: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1986 and 1987

(Values in Thousands of Dollars)

Machine Classification	1986		1987	
	Units	Value	Units	Value
GRAND TOTAL	44,998	$564,906(a)	39,355	$585,842(a)
Complete New Machines	41,553	$335,150	33,927	$338,988
Gear Hobbers and Shapers	91	8,131	59	7,048
Gear Cutting Machines, N.E.C.	90	20,841	113	30,884
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	16	1,589	29	1,734
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	8	3,810	5	739
Horizontal Machining Centers, ATC, NC	27	7,637	24	6,286
Machining Centers, NC, N.E.C.	80	7,455	144	11,815
Single Station and Multi-Station Transfer Machines	47	37,400	23	14,550
Way Type Machines (Unit Heads)	2	75	13	2,245
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	11	4,471	11	2,212
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	2	164	9	1,224
Vertical Boring-Drilling-Milling Machines, NC	49	2,588	12	1,159
Horiz. Boring-Drilling-Milling Machines, non-NC	11	1,287	15	1,508
Vertical Boring-Drilling-Milling Machines, non-NC	36	3,395	73	2,228
Drilling Machines, NC	19	2,013	28	3,235
Drilling Machines, Multi-Spindle, non-NC	48	8,569	46	2,489
Drilling Machines, Radial, non-NC	27	498	41	433
Drilling Machines, Upright, Single Spindle, non-NC	13	234	14	246
Drilling Machines, non-NC, N.E.C.	173	4,091	195	4,096
Milling Machines, NC	33	9,710	82	19,073
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	59	4,665	19	641
Milling Machines, Knee Type, non-NC	8	511	3	92
Milling Machines, Bed Type, non-NC	16	3,261	2	112
Milling Machines, non-NC, N.E.C.	111	7,055	224	4,826
Vertical Boring Machines, incl. VTL's, NC	15	5,814	5	1,331
Vertical Boring Machines, incl. VTL's, non-NC	346	21,939	140	9,794
Boring Machines, NC, N.E.C.	6	1,728	4	926
Boring Machines, non-NC, N.E.C.	83	4,769	77	5,255
Horizontal Lathes, Multi-Spindle, NC	7	897	17	2,322
Horizontal Lathes, excl. Multi-Spindle, NC, Less Than 25 HP	130	9,829	103	8,383
Horizontal Lathes, excl. Multi-Spindle, NC, 25-50 HP	22	3,278	26	3,647
Horizontal Lathes, excl. Multi-Spindle, NC, Over 50 HP	9	1,489	15	2,947
Horizontal Engine & Toolroom Lathes, non-NC	68	1,154	74	1,157
Automatic Chucking Lathes, Single Spindle, non-NC	11	1,878	8	1,063
Automatic Chucking Lathes, Multi-Spindle, non-NC	14	620	19	1,996
Automatic Bar Machines, Single Spindle, non-NC	28	1,066	44	1,439
Automatic Bar Machines, Multi-Spindle, non-NC	24	1,214	49	1,922
Horizontal Lathes, non-NC, N.E.C.	1,426	21,775	508	14,973
Vertical Lathes, Multi-Spindle, excl. VTL's, NC	13	3,582	6	1,342
Vertical Lathes, excl. Multi-Spindle & VTL's, NC	31	3,275	14	1,401
Vertical Lathes, excl. VTL's, non-NC	146	8,911	149	9,149
Grinding, Polishing, Honing & Lapping Machines, NC	86	10,409	188	31,060
Gear Tooth Grinding & Finishing Machines, non-NC	54	6,650	26	3,568
Tool & Cutter Grinding Machines, non-NC	170	5,306	238	7,976
Honing & Lapping Machines, non-NC	243	8,822	388	6,852
Grinding Machines, Flat Surface Reciprocating Table, non-NC	58	1,415	117	1,975
Grinding Machines, Flat Surface, non-NC, N.E.C.	194	15,281	368	23,366
External Grinding Machines, non-NC	28	2,981	41	4,043
Internal Grinding Machines, non-NC	11	2,190	34	6,310
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	160	8,097	188	10,665
Grinding Machines, non-NC, N.E.C.	214	5,863	339	11,480

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1986 and 1987

(Values in Thousands of Dollars)
(Continued)

Machine Classification	1986		1987	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	8	$ 447	17	$ 258
All Other Electrical Discharge Machines	97	2,025	139	3,247
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	15	1,511	19	1,065
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	35	1,120	52	1,845
Metal Cutting Machine Tools, NC, N.E.C.	19	1,213	75	5,047
Sawing & Cut-off Machines, non-NC	438	8,435	467	6,961
Broaching Machines, non-NC	10	592	13	383
Metal Cutting Machine Tools, non-NC, N.E.C.	188	7,026	200	10,218
Metal Cutting Machine Tools, Less Than $2,500	36,169	13,023	28,576	14,664
Metal Cutting Machine Tools, Used or Rebuilt	3,445	36,115	5,628	44,557
Parts	—	193,641	—	202,297

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1986 and 1987

(Values in Thousands of Dollars)

Machine Classification	1986		1987	
	Units	Value	Units	Value
GRAND TOTAL	8,088	$343,203(a)	11,924	$424,367(a)
Complete New Machines	7,150	$211,460	11,210	$247,760
Die Casting Machines & Parts	—	18,351	—	17,651
Metal Forming Machine Tools, Less Than $2,500	4,106	2,764	7,114	4,217
Punching & Shearing Machines, incl. Combination, NC	40	4,415	71	8,543
Shearing Machines, non-NC	64	1,464	85	3,566
Punching & Combination Punching & Shearing Mach., non-NC	466	15,966	601	10,398
Bending, Folding, Straightening & Flattening Machines, NC	119	5,961	79	5,019
Press Brakes, non-NC	96	4,154	38	1,683
Bending Rolls, Ram & Press Bending Machines, non-NC	19	1,357	16	1,085
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	473	22,424	726	25,552
Mechanical Presses, non-NC	165	14,843	255	22,889
Hydraulic Presses, Vertical, Single Action	47	8,704	56	6,733
Hydraulic & Pneumatic Presses	703	39,917	759	41,441
Headers & Upsetters, non-NC	70	11,487	90	15,865
Forging Machines, non-NC, N.E.C.	94	8,169	190	8,038
Metal Forming Machine Tools, non-NC, N.E.C.	688	51,450	1,130	75,039
Metal Forming Machine Tools, Used or Rebuilt	938	7,599	714	19,121
Parts	—	124,144	—	157,486

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1959 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
Year	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1959	$ 135.0	$ 82.2	$ 52.8	$ 32.5	$ 23.8	$ 8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	220.6	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981	1,445.6	974.2	471.4	1,712.9	1,485.1	227.8
1982	1,002.4	630.5	371.9	1,489.4	1,258.1	231.3
1983	691.9	430.8	261.1	1,100.2	836.9	263.3
1984	734.9	446.0	289.0	1,652.7	1,316.5	336.1
1985	772.2	494.6	277.6	2,110.1	1,685.6	424.5
1986	908.1	564.9	343.2	2,682.9	2,015.3	667.6
1987	1,010.2	585.8	424.4	2,412.3	1,803.0	609.3

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146."

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES
INCLUDING VERTICAL TURRET LATHES
1968 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Exports Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B Factory	Units	Customs Import Value (c)
1968	383	$14.4	147	$ 4.4	1,057	$19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,083	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981	797	79.4	NA	41.5E	3,158	86.7
1982	303	32.4	NA	14.9	3,140	78.8
1983	193	18.5	NA	D	1,327	44.6
1984	266	17.6	NA	3.5	844	49.7
1985	247	23.3	NA	3.4	972	50.4
1986	559	46.2	NA	D	1,240	119.6
1987	346	25.6	NA	D	1,020	82.0

NA - Not Available. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

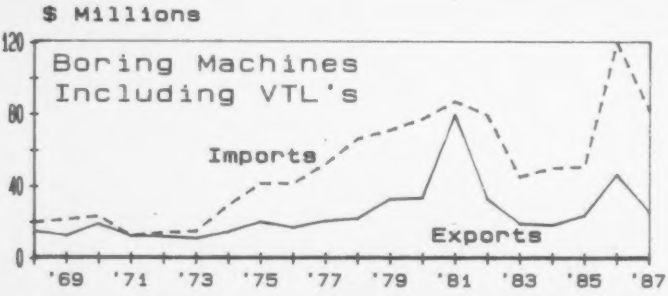
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments exclude vertical turret lathes.

(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

The user should be aware that the minimum valuation of machines included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES
1968 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1968	1,811	$ 6.8	724	$ 4.7	5,403	$10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980	546	22.2	NA	12.2	2,253	27.2
1981	566	24.4	NA	12.1	2,238	26.4
1982	349	12.4	NA	3.4	1,317	20.7
1983	233	8.3	NA	5.1	585	9.9
1984	222	10.3	NA	1.2	916	17.9
1985	197	6.9	NA	3.0	1,314	32.6
1986(r)	280	15.4	NA	.7	1,266	39.1
1987(p)	324	10.5	NA	.8	1,211	29.1

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

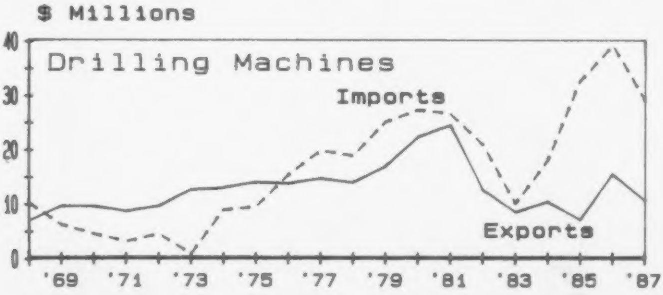
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metal working Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES
1968 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1968	1,266	$26.6	647	$30.8	297	$ 3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684(e)	43.8(e)	NA	D	466	33.1
1980	519(e)	61.2(e)	NA	D	415	41.3
1981	698(e)	80.1(e)	NA	D	367	37.0
1982	369(e)	37.4(e)	NA	D	281	25.8
1983	65	11.8	NA	D	153	13.8
1984	84	17.3	NA	D	328	18.1
1985	105	20.4	NA	D	301	20.5
1986	235	35.6	NA	D	557	32.6
1987	198	41.5	NA	D	509	50.0

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

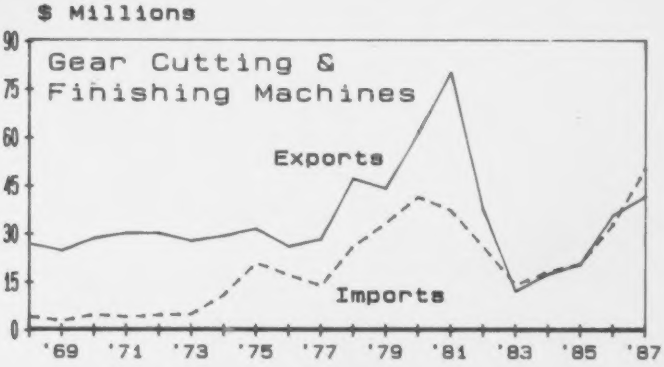
(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

(e) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES

1968 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1968	7,679	$28.9	3,354	$27.7.	5,792	$17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	48.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2(d)
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980	1,979	85.1	NA	75.4	5,698	138.6
1981	2,694	126.5	NA	88.2	5,334	137.2
1982	1,877	71.1	NA	69.3	4,530	117.6
1983	930	49.0	NA	54.2	3,282	89.6
1984	999	46.7	NA	34.1	5,249	118.5
1985	1,365	56.6	NA	36.8	6,746	147.9
1986(r)	1,164	60.4	NA	45.4	6,611	190.0
1987(p)	1,901	103.7	NA	59.4	5,885	177.6

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

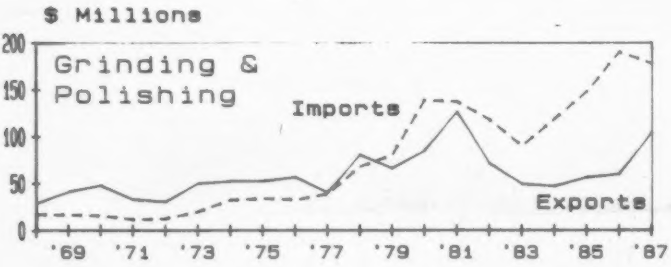
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31,000.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN LATHES, EXCLUDING VERTICAL TURRET LATHES

1968 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1968	2,161	$18.8	683	$15.3	11,452	$38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,801	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5(d)	18,332	353.6
1980	1,107	67.1	NA	50.8(d)	16,710	380.0
1981	1,466	90.0	NA	58.5(d)	15,445	479.8
1982	957	70.4	NA	36.8	11,141	338.6
1983	687	34.9	NA	D	6,662	165.7
1984	904	39.4	NA	D	9,019	268.1
1985	1,030	52.0	NA	D	11,938	350.3
1986	1,929	59.0	NA	D	11,767	391.1
1987	1,032	51.7	NA	D	8,457	331.5

NA-Not Available. E-Estimate by NMTBA. D-Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

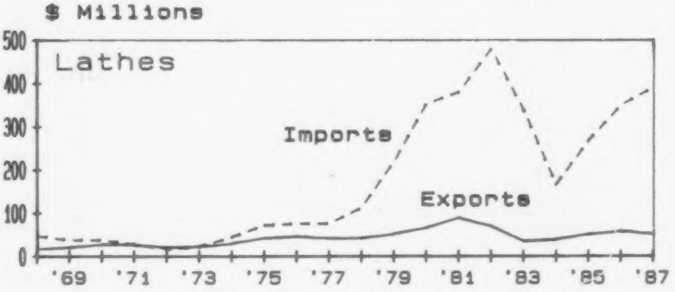
(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(d) Does not include data for Vertical NC Lathes.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MILLING MACHINES
1968 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1968	848	$17.9	304	$12.1	5,428	$30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981	292	37.8	NA	33.4	10,434	124.7
1982	331	22.4	NA	21.0	5,985	87.7
1983	187	13.9	NA	9.0	3,660	52.5
1984	209	22.7	NA	16.1	6,471	83.4
1985	333	19.3	NA	26.8	7,736	133.7
1986(r)	227	25.2	NA	15.3	6,551	113.8
1987(p)	330	24.7	NA	22.3	4,766	87.4

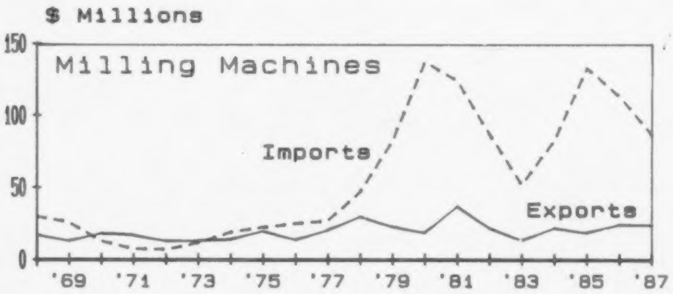
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MACHINING CENTERS

1979 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980	313	56.7	NA	$57.9	957	93.4
1981	316	53.4	NA	43.0	2,007	195.7
1982	195	34.0	NA	D	1,873	188.9
1983	102	13.3	NA	D	1,936	164.9
1984	117	18.6	NA	10.2	2,911	248.0
1985	156	21.0	NA	D	4,186	330.0
1986(r)	131	20.5	NA	17.5	4,037	361.8
1987(p)	202	20.6	NA	23.8	2,914	313.4

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS(c,d)

1963 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1963	9,636	$ 25.4	3,382	$ 16.7	4,849	$ 5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,434	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,728	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980	53,943	150.6	NA	173.2	582,050	169.7
1981	70,191	232.1	NA	168.7	901,398	204.5
1982	48,525	123.4	NA	49.2(e)	1,174,244	199.2
1983	38,895	108.4	NA	23.2(e)	1,753,390	175.7
1984	40,538	77.6	NA	12.8(e)	1,331,381	252.8
1985	32,917	86.3	NA	17.0(e)	1,035,677	309.3
1986(r)	40,473	109.0	NA	10.3(e)	872,862	406.5
1987(p)	35,222	105.4	NA	30.5(e)	1,099,238	364.7

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other." After 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

(e) Does not include data for Station Type Machines.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS

1968 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
Year	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New(b)	Used	Parts	Customs Import Value (a)
1968	$107.8	$33.9	$10.2	$ 5.9	$ 5.5	$ 25.4	$ 3.6	$ 23.3	$ 25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	29.2
1970	135.1	25.9	11.0	6.5	8.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	21.3	9.4	10.8	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.1	46.6	25.6	15.4	13.4	78.5	14.9	63.7	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.8	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.6	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8
1982	371.9	53.8	35.1	32.9	15.3	61.7	12.5	160.5	231.3
1983	261.1	30.0	19.7	18.1	7.9	52.8	19.2	113.4	263.3
1984	289.0	36.0	19.4	22.6	11.8	60.1	9.1	129.9	336.1
1985	277.5	41.7	30.3	18.1	12.2	55.6	8.5	111.1	424.5
1986	343.2	63.4	33.9	21.8	19.7	72.6	7.6	124.1	667.6
1987	424.4	71.0	33.3	22.5	23.9	96.9	19.1	157.5	609.3

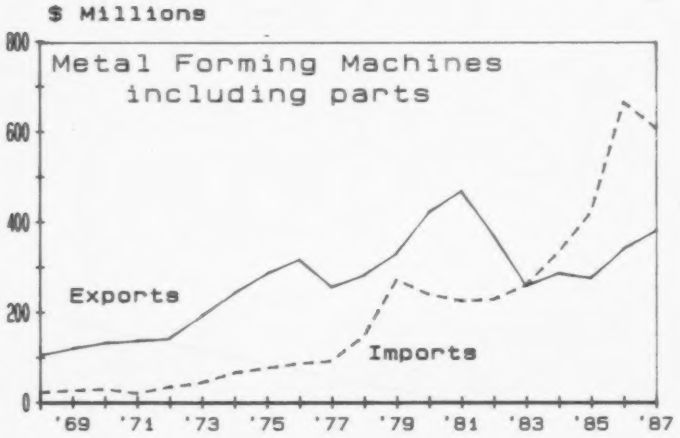
(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(b) Beginning in 1980 "Die Casting Machines" are included.

Individual items may not add to total due to rounding.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1960 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
Year	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1960	2,716	$ 47.3	893	$23.3	913	$ 5.6	307	$ 5.1	173	$ 9.0	430	$ 4.2
1961	2,758	55.2	934	30.7	930	4.7	283	6.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981	NA	156.7	NA	43.1	NA	29.8	NA	29.5	NA	D	NA	D
1982	NA	118.4	NA	36.6	NA	19.6	NA	16.2	NA	D	NA	D
1983	NA	54.3	NA	13.6	NA	13.9	NA	9.8	NA	D	NA	D
1984	NA	62.7	NA	15.2	NA	14.4	NA	6.8	NA	D	NA	D
1985	NA	77.6	NA	15.4	NA	15.8	NA	20.5	NA	8.5	NA	17.4
1986(r)	NA	63.4	NA	11.9	NA	22.0	NA	11.5	NA	5.3	NA	12.6
1987(p)	NA	100.0E	NA	20.3	NA	26.6	NA	17.2	NA	13.5E	NA	22.4E

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: first, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1960 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1960	13,203	$157.5	10,487	$110.2	2,716	$ 47.3
1961	14,080	207.2	11,322	152.0	2,758	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10,037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,780	57.7
1972	12,093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980	NA	630.8	NA	482.3	NA	148.5
1981	NA	675.0	NA	518.3	NA	156.7
1982	NA	427.5	NA	309.1	NA	118.4
1983	NA	212.3	NA	158.0	NA	54.3
1984	NA	178.7	NA	115.9	NA	62.7
1985(r)	NA	280.6	NA	203.0	NA	77.6
1986(r)	NA	259.3	NA	196.0	NA	63.4
1987(p)	NA	322.8E	NA	222.8	NA	100.0E

NA - Not Available. p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b, factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Note: See note on page 156.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL CUTTING MACHINE TOOLS

1980 to DATE

(Values in Millions of Dollars)

Machine Classification	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987(p)
METAL CUTTING MACHINE TOOLS	$482.3	$518.3	$309.1	$158.0	$115.9	$203.0	$196.0	$222.8
Boring Machines	17.7	D	14.9	D	3.5	3.4	D	D
Drilling Machines	12.2	12.1	3.4	5.1	1.2	3.0	.7	.8
Valued at $2,500	.2	.2	D	D	D	D	D	D
All other Drilling Machines	12.0	12.0	D	D	D	D	D	D
Gear Cutting Machines	D	D	D	D	D	D	D	D
Grinding, Polishing, Buffing								
Honing & Lapping Machines	75.4	88.2	69.3	54.2	34.1	36.8	45.5	59.4
Valued at under $2,500	.6	.6	.4	.4	.7	.6		.7
External Cylindrical Grinding								
Plain (incl. angular							9.6	
wheel type) & Universal	D	10.4	10.3	D	10.6	6.3		11.9
Roll, Centerless, & Chuck type grinder	D	30.4	26.4	21.5				
All other grinding machines	D							
Internal Cylindrical Grinding Surface Grinding Machines:								
Rotary & Reciprocating table type	10.3	10.3	9.2	D	17.9	7.4	11.6	34.1
All other Surface Grinders	2.0	36.5	5.3	2.7				
All other Grinding Machines	15.3			5.0		16.3	16.4	
Honing & Lapping Machines	18.3		17.6	14.9	5.0	6.1	7.8	12.7
Polishing & Buffing Machines								
Horizontal NC Turning Machines	21.6	21.2	17.2	D	10.8	14.1	12.7	18.6
Vertical NC Turning Machines	D	D	2.5	D	0	D	D	D
Non-NC Turning Machines	29.2	37.3	17.1	9.9	5.0	11.0	13.3	14.1
Valued under $2,500	1.5	D	D	D				
Engine or Tool Room lathes, swing over cross slide	D	3.1	2.2	D				
Turret lathes, horizontal	D	6.4	D	D				
Automatic lathes								
Single spindle	D							
Multiple spindle	14.7	26.3	D	D				
All other Horizontal lathes	D	D	4.6	D				
All other Vertical lathes								
Milling Machines	27.9	33.4	21.0	9.0	16.1	26.8	15.3	22.3
Machining Centers	57.9	43.0	D	D	10.2	D	17.5	23.8
Drill, Mill, Bore, manual tool change	D	D	D	D	D	D	D	D
Drill, Mill, Bore, (ATC) Vertical	18.4	15.0	D	D	4.5	5.0	5.1	9.0
Horizontal	36.2	24.4	19.3	D	D	12.4	D	D
All other Machining Centers	D	D	D	D	0	D	0	D
Station Type Machines	133.9	111.0	D	D	D	D	D	D
Other Metal Cutting Machines	39.3	57.8	49.2	2[illegible].2	12.8	17.0	10.3	30.5

D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

Source: U.S. Department of Commerce, Current Industrial Reports, MQ-35W.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS

1982 to DATE

(Values in Millions of Dollars)

Machine Classification	1982	1983	1984	1985(r)	1986(r)	1987(p)
METAL FORMING MACHINE TOOLS	$118.4	$54.3	$62.7	$77.6	$63.4	$100.0E
Punching, Shearing, Bending and Forming Machines	35.7	23.7	21.2	36.3	33.5	43.8
Punching & Shearing valued under $2,500	.3	.2	.3	.3	.3	.2
Punches, incl. combination Punching & Shearing Machines	3.2	8.2	4.8	20.2	11.3	17.0
Punching Machines fixed position and two axes positioning table	7.0					
Plate Shearing Machines Other Punching & Shearing	5.7	1.3	1.7			
All Bending & Forming valued under $2,500	.7	.4	.4	.8	.7	1.0
Press Brakes Bending Rolls Rotary Bending & Forming Machines (incl. Rotary Head) Ram & Press Bending Machines	8.7	6.1	13.9	6.8	21.3	25.6
Other Bending & Forming	10.2	7.4		8.2		
Presses, except forgings	36.6	13.6	15.2	15.4	11.9	20.3
Presses valued under $2,500	.4	.3	D			
Mechanical Presses:						
Open Back Inclinable	D	D	D	7.0	9.8	D
Other Mechanical Presses	15.4	5.8	D			
Hydraulic Presses	D	D	D	8.4	2.1	D
Forging Machines	D	D	D	8.5	5.3	13.5E
Other Metal Forming Machines	D	D	D	17.4	12.6	D
Thread Rolling	D	D	D	7.3	1.1	D
Metal Container Making Machinery	10.3(a)	7.5(a)	6.6(a)		4.7	
Die Casting	D	D	D	0	0	
Riveting Machines	D	D	D	0	6.7	
Other Metal Forming Machines	7.7	4.4	8.3	10.0		

E - Estimate by NMTBA. D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

(a) "Metal Container Making Machinery" was included with "Other Metal Forming Machines" prior to 1982.

Source: U.S. Commerce Department, Current Industrial Reports, MQ35W.

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6

WORLD MACHINE TOOL INDUSTRY

As is the case with many other manufactured products, the machine tool market has rapidly become internationalized over the course of the past fifteen years. During the 1960's the majority of the world's machine tools came from the U.S. and western Europe. This is no longer the case, as Japan has become a formidable global competitor and many developing nations are developing their domestic machine tool industries. In order to accurately reflect the state of the machine tool industry and market in the U.S., it is therefore useful to put it into a global context. The statistics in this chapter are intended to do this. Using a wide variety of information, obtained primarily from foreign governments and trade associations, this chapter contains a comprehensive review of worldwide machine tool production, exports and imports.

For many years American Machinist magazine has published estimates of world machine tool production and trade. These estimates, which cover 35 countries, came from unofficial sources and were revised for previous years when "official" figures become available. Whenever possible, this data includes only complete machine tools and excludes parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

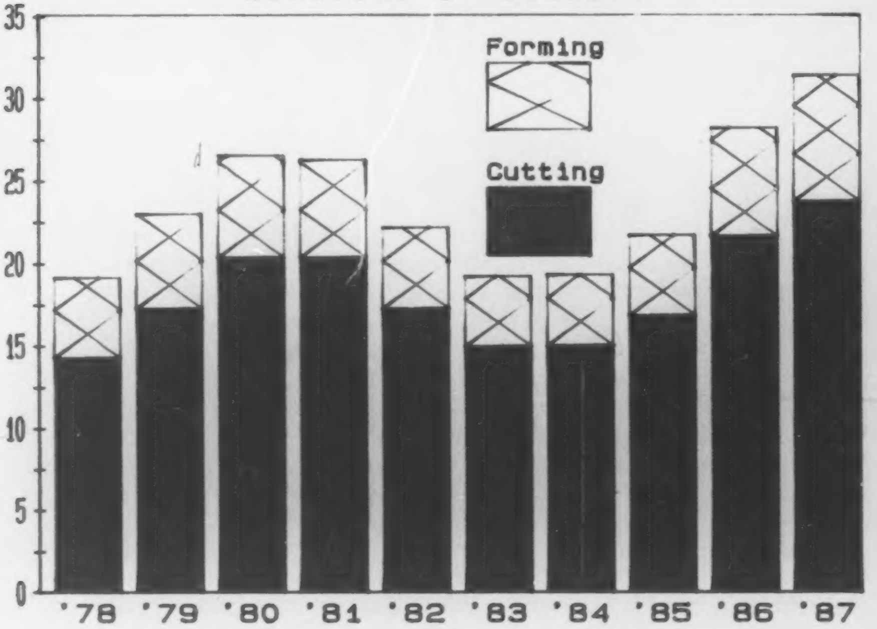
Several years ago, the trade associations of 12 European countries (co-operating through a group called CECIMO), the United States, Japan, and India agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1986 are included in this chapter. The machine tool production of the 12 reporting countries totaled about $19.7 billion in 1986.

In the uniform international statistical reporting system for CECIMO, each participating country reports its data in Swiss Francs. In this chapter, these data have been converted into dollars with the conversion rates below the tables. These tables can be identified through the reference to "International Statistics on Machine Tools" as the source.

With the "floating" of many world currencies and the dramatic rise and decline of the value of the dollar in recent years, measuring the value of production and trade statistics has become increasingly confusing. Foreign data in this Handbook has been converted into dollars on the basis of trade conversion factors, as given in the International Monetary Fund's "International Financial Statistics." It may be necessary to convert dollar-denominated statistics back into national currency when one is attempting to analyse rates of change. The dollar-denominated figures may show declines (increases) at the same time when national currency figures reflect significant gains (declines).

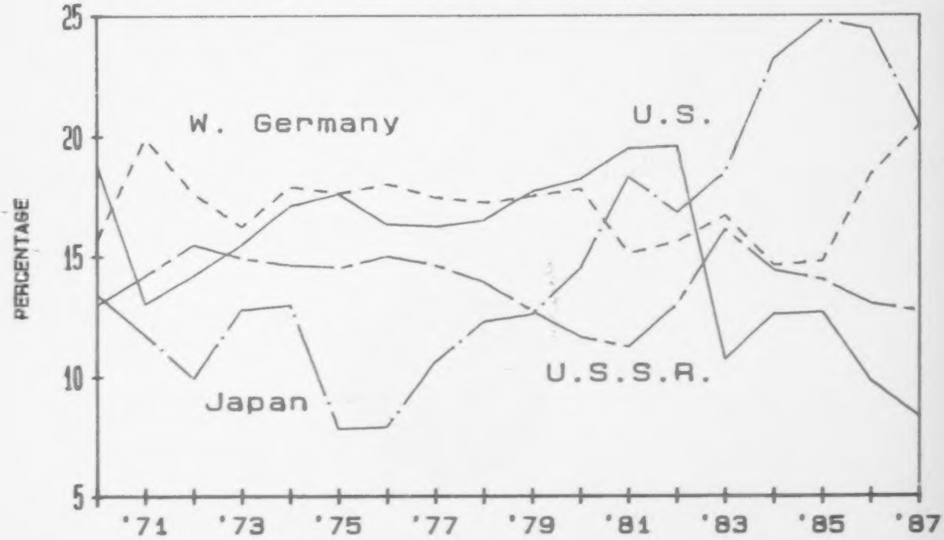
World Machine Tool Production

Billions of Dollars



SHARE OF WORLD MACHINE TOOL OUTPUT

(Machine Tool Output as % of World Output)



WORLD MACHINE TOOL PRODUCTION, 1971 to Date
(Millions of U.S. Dollars) (a)

	Total	Metal Cutting	Metal Forming
1971	$ 8,148.9	$ 5,951.5	$ 2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980	26,501.3	20,268.4	6,232.8
1981	26,209.5	20,274.9	5,934.5
1982	22,071.3	17,171.4	4,957.0
1983	19,147.2	14,862.9	4,284.2
1984	19,250.6	14,912.1	4,338.5
1985	21,480.1	16,735.5	4,744.7
1986(r)	28,154.7	21,549.5	6,605.1
1987(p)	31,330.9	23,644.3	7,684.6

p - Preliminary. r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Source: Penton Publishing Inc., "American Machinist," Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

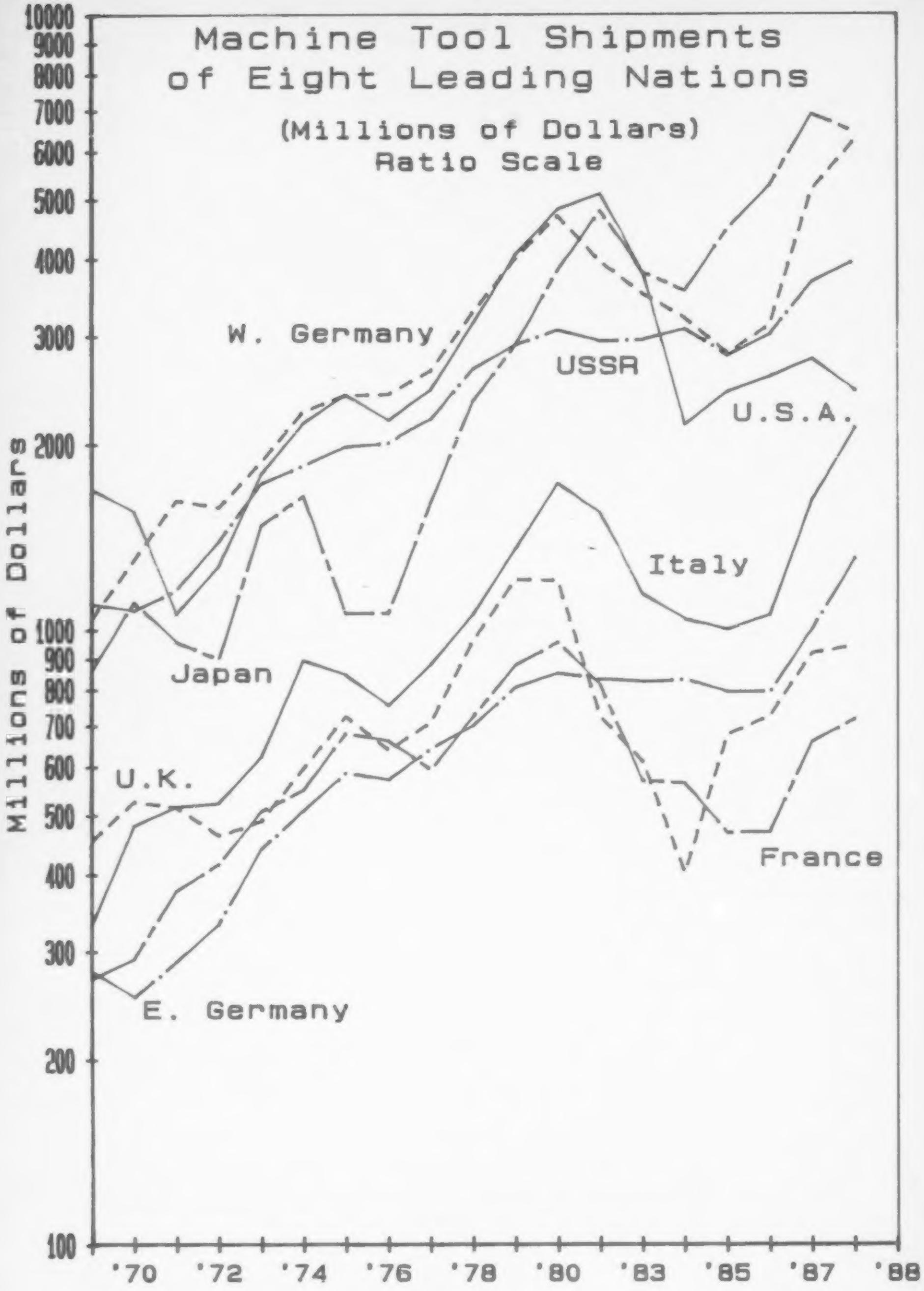
LEADING MACHINE TOOL CONSUMING NATIONS (a)
1987 and 1986
(Millions of U.S. Dollars)

			Percent Change(b)	
Country	1987	1986	Nat'l. Currency	U.S. Dollars
1. U.S.S.R.	$5,303.2	$4,897.4	–4.2%	8.3%
2. FRG (West Germany)	4,270.2	3,325.8	6.3	28.4
3. United States	3,967.2	4,418.4	–10.2	–10.2
4. Japan	3,655.5	4,081.5	–23.1	–10.4
5. Italy	1,753.2	1,001.7	52.2	75.0
6. France	1,151.1	898.0	11.2	28.2
7. South Korea	979.5	664.6	37.5	47.4
8. United Kingdom	617.5	721.4	–4.4	–14.4
9. Canada	538.7	421.6	21.9	27.8
10. Spain	489.7	323.4	33.6	51.4
11. PRC (China)	449.0	478.7	—	—
12. Taiwan	412.7	185.0	92.9	123.1
13. Brazil	410.0	379.0	8.2	8.2
14. Yugoslavia	405.3	314.3	145.4	28.9
15. Switzerland	400.0	276.3	20.0	44.8
16. Sweden	377.3	301.4	11.4	25.2
17. GDR (East Germany)	306.2	177.5	43.8	72.5
18. India	290.2	286.9	4.0	1.2
19. Mexico	267.4	216.0	23.8	23.8
20. Belgium	206.1	169.1	1.9	21.9
21. Bulgaria	205.0	213.4	—	—
22. Poland	190.0	168.4	—	—
23. Australia	177.5	169.0	0.4	5.0
24. Czechoslovakia	160.0	153.4	—	—
25. Netherlands	158.1	175.1	–25.3	–9.7
26. Hungary	156.4	136.3	—	14.7
27. Denmark	154.8	134.1	–2.4	15.4

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ for some countries. These percent change values are not influenced by currency conversion rates and, therefore, more realistically reflect changes in machine tool consumption.

Source: Penton Publishing Inc., "American Machinist," International Statistics on Machine Tools and NMTBA.


Machine Tool Shipments
of Eight Leading Nations
(Millions of Dollars)
Ratio Scale
Millions of Dollars
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
900
800
700
600
500
400
300
200
100
W. Germany
USSR
U.S.A.
Italy
Japan
U.K.
France
E. Germany
'70
'72
'74
'76
'78
'80
'83
'85
'87
'88

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1987 (estimated)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 6,426.0	$ 4,762.0	$1,664.0	$3,034.8	$ 264.3
2. FRG (West Germany)	6,402.0	4,653.0	1,750.0	3,306.2	1,174.4
3. Soviet Union*	3,976.3	3,234.0	742.3	312.3	1,639.2
4. United States	2,585.0	1,778.4	806.6	586.7	1,968.9
5. Italy	2,235.2	1,554.9(a)	680.3(a)	1,048.5	566.5
6. Switzerland	1,475.7	1,267.7	207.9	1,435.8	360.1
7. GDR (East Germany)*	1,302.5	1,046.5	256.0	1,193.7	197.5
8. France	697.3	556.1	141.2	284.3	738.1
9. United Kingdom	601.6	508.7	92.9	501.0	516.9
10. Taiwan	577.8	482.6	92.3	379.9	214.8
11. Yugoslavia	573.8	425.8	148.1	325.3	156.7
12. South Korea	530.9	393.5	137.4	37.5	486.1
13. Spain	510.0	395.0	114.9	238.8	218.6
14. Czechoslovakia*	405.0(b)	360.0(b)	45.0(b)	330.0(b)	85.0(b)
15. Brazil	400.0	300.0	100.0	39.0	49.0
16. Romania*	355.0(b)	330.0(b)	25.0(b)	55.0(b)	75.0(b)
17. PRC (China)*	342.0(b)	285.0(b)	57.0(b)	8.0(b)	115.0(b)
18. India	189.3	110.4(a)	78.9(a)	45.7	146.6
19. Sweden	257.8	156.5	99.3	192.8	312.3
20. Hungary*	216.8	196.7	20.1	184.6	124.2
21. Canada	197.7	125.9	71.8	61.0	402.0
22. Belgium	179.3	42.8	136.5	294.3	321.1
23. Poland*	173.0(b)	150.0(b)	23.0(b)	78.0(b)	95.0(b)
24. Austria	155.0(b)	120.0(b)	35.0(b)	169.7	173.7
25. Bulgaria*	140.0(b)	130.0(b)	10.0(b)	85.0(b)	150.0(b)
26. Israel	130.0(b)	95.0(b)	35.0(b)	115.0	153.0
27. Denmark	89.0	64.4	24.6	62.8	128.6
28. Australia	45.0(b,c)	17.0(b,c)	28.0(b,c)	4.9(b,c)	137.4(b,c)
29. Netherlands	40.7	28.6	12.1	118.3	235.7
30. Singapore	35.5	32.0	3.5	85.0	145.0
31. Finland	29.5	4.5	25.0	33.7	117.3
32. Mexico	21.4	17.8	3.6	2.7	248.7
33. Portugal	18.7	7.5	11.2	9.4	33.0
34. South Africa	14.7	9.8	4.9	2.5	63.8
35. Hong Kong	1.4	0.2	1.2	6.0	75.0
Total	31,330.9	23,644.3	7,684.6	14,668.2	11,888.5

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(b) Rough estimate from fragmentary data.
(c) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union, Bulgaria, Czechoslovakia and Poland at 70% of the official rate; GDR at 65% of the FRG rate; Hungary, PRC (China), and Romania at IMF commercial rates.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. For 1987, conversion is based on IMF rates for the first nine months and bank-transfer rates for the last three months.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: Penton Publishing Inc., "American Machinist," International Statistics on Machine Tools, and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1986 (revised)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 6,872.6	$ 5,337.1	$ 1,535.5	$ 3,063.4	$ 272.3
2. FRG (West Germany)	5,185.4	3,743.7	1,441.7	2,880.9	1,021.3
3. Soviet Union*	3,672.0	2,963.8	708.2	288.4	1,513.8
4. United States	2,747.9	1,962.3	785.6	546.6	2,217.1
5. Italy	1,624.6	1,131.2(a)	493.4(a)	969.7	346.8
6. Switzerland	1,223.0	1,095.7	127.3	1,259.9	313.2
7. GDR (East Germany)*	1,000.7	804.0	196.7	980.0	156.9
8. France	588.1	471.3	116.8	308.1	618.0
9. United Kingdom	550.0	454.3	95.6	377.5	548.9
10. Spain	396.3	307.6	88.7	178.7	105.8
11. Yugoslavia	390.4	259.3	131.1	219.4	143.3
12. Czechoslovakia*	383.0(b)	340.8(b)	42.2(b)	310.3(b)	80.7(b)
13. Brazil	370.0	280.0	90.0	39.0	48.0
14. PRC (China)*	363.7(b)	303.1(b)	60.6(b)	8.3(b)	123.3(b)
15. Taiwan	356.7	326.5	30.2	254.2	82.5
16. South Korea	334.3	214.8	119.5	27.7	358.0
17. Romania	307.0(b)	283.4(b)	23.6(b)	52.0(b)	70.8(b)
18. Sweden	236.7	148.1	88.6	164.6	229.3
19. Canada	209.5	144.3	65.2	144.2	356.3
20. Hungary*	180.3	156.8	23.5	138.7	94.7
21. Austria	156.2(b)	121.4(b)	34.8(b)	160.9	151.4
22. India	153.8	129.9(a)	23.9(a)	33.4	166.5
23. Poland*	153.5(b)	133.6(b)	20.0(b)	69.3(b)	84.2(b)
24. Belgium	150.8	36.3	114.8	263.3	281.6
25. Bulgaria*	143.2(b)	132.1(b)	11.0(b)	86.3(b)	156.5(b)
26. Israel	130.0	95.0	35.0	95.0	118.0
27. Denmark	71.7	51.9	19.8	51.9	114.3
28. Netherlands	63.9	45.1	18.8	114.0	225.2
29. Australia	39.2(c)	14.8(c)	24.5(c)	4.2(c)	133.9(c)
30. Singapore	34.4	31.3	3.1	84.5	144.7
31. Finland	24.5	3.6	20.9	18.4	93.4
32. Mexico	16.5	14.0	2.5	2.5	202.0
33. Portugal	12.5	5.0	7.5	7.4	27.8
34. South Africa	11.0	7.5	3.5	4.0	52.9
35. Hong Kong	1.3	0.1	1.2	6.1	74.2
Total	28,154.7	21,549.5	6,605.1	13,212.8	10,727.6

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.

(b) Rough estimate from fragmentary data.

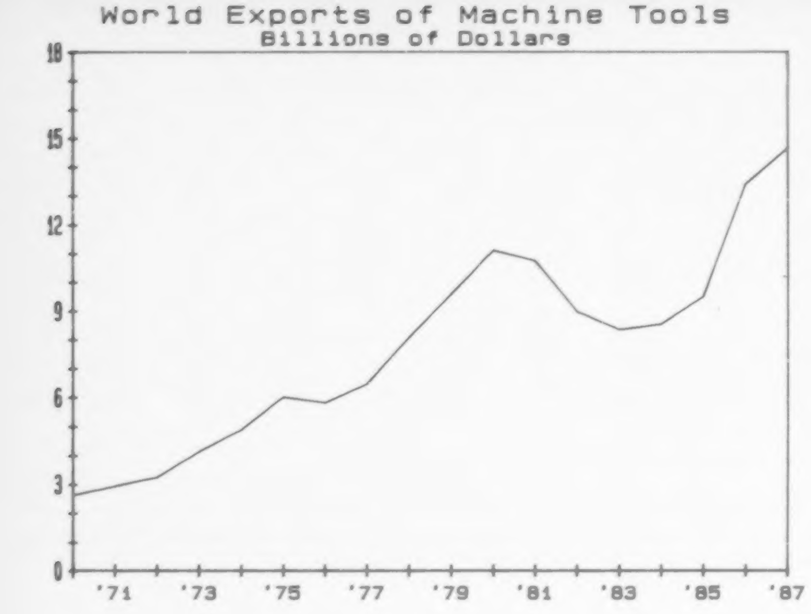
(c) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union, Bulgaria, Czechoslovakia and Poland at 70% of the official rate; GDR at 65% of the FRG rate; Hungary, PRC (China), and Romania at IMF commercial rates.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. For 1986, the rate is that reported as the average daily market rate by the International Monetary Fund.

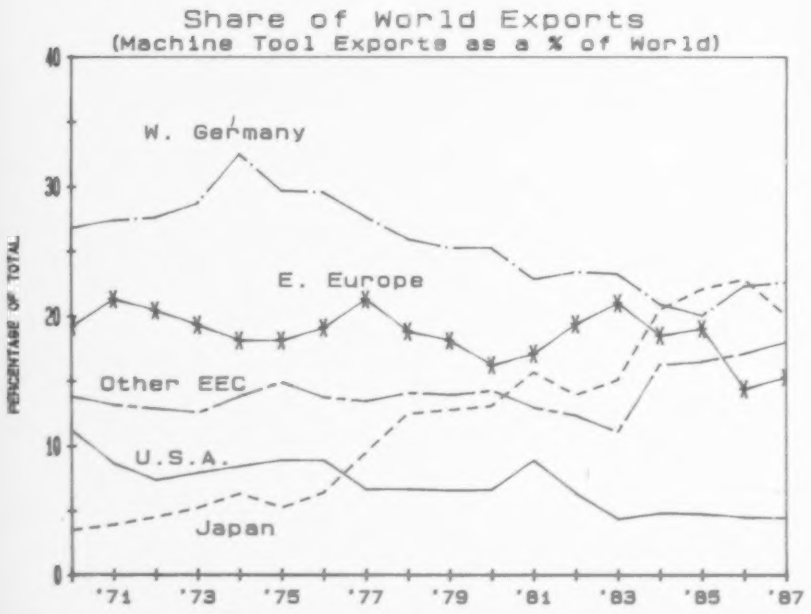
Notes: Whenever possible, data include machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: Penton Publishing Inc., "American Machinist," International Statistics on Machine Tools, and NMTBA.



World Exports of Machine Tools

Billions of Dollars



Share of World Exports

(Machine Tool Exports as a % of World)

PRODUCTION, EXPORTS AND IMPORTS OF COMPLETE MACHINE TOOLS

Selected Countries, 1984 To 1986

(Millions of U.S. Dollars)

	Production			Exports			Imports		
Country	1984	1985	1986	1984	1985	1986	1984	1985	1986
Belgium	$ 77.1	$ 93.4	$ 150.8	$ 104.2	$ 132.6	$ 263.3	$ 126.8	$ 166.0	$ 281.6
France	465.5	499.3	588.1	250.1	208.5	308.1	301.2	357.5	618.0
India	180.5	165.9	185.2	13.6	22.2	33.4	141.6	NA	128.1E
Italy	996.0(a)	1,115.6(a)	1,624.6	557.8(a)	707.6(a)	969.6	182.7(a)	196.4(a)	346.6
Japan	4,473.3	5,316.7	6,872.3	1,751.5	2,179.0	3,063.4	181.4	219.0	272.3
Netherlands	34.4	37.6	NA	56.2	69.7	113.9	107.5	137.7	225.3
Spain	211.5	253.2	396.3	113.3	151.5	178.7	56.1	58.9	105.8
Sweden	157.9	163.3	226.6	124.9	139.4	164.7	127.8	157.0	229.4
Switzerland	653.3	822.1	1,223.0	577.9	715.9	1,079.6	130.2	170.1	313.0
United Kingdom	376.9	430.4	539.9	302.4	373.3	394.4	342.4	432.6	544.1
United States	2,412.0	2,638.0	2,747.0	373.0	388.0	617.0	1,319.0	1,689.0	2,252.0
West Germany	2,803.7	3,168.2	5,185.9	1,781.9	1,930.4	3,079.8	467.0	612.8	1,050.0

E - Estimate. NA - Not Available.

(a) Data does not include polishing, honing, or lapping machines.

Note: Exchange rates used to convert the national currencies into U.S. dollars are the annual averages for 1986 published in the International Monetary Fund's "International Financial Statistics", (monthly).

Source - International Statistics on Machine Tools jointly prepared by CECIMO (Comite European de Cooperation des Industries de la Machine Tool); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA - The Association for Manufacturing Technology.

PRODUCTION, EXPORTS AND IMPORTS OF COMPLETE MACHINE TOOLS

Selected Countries, 1986

(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Belgium	$ 150.8	$ 36.3	$ 114.8	$ 263.3	$ 161.4	$ 101.9	$ 281.6	$ 222.5	$ 59.1
France	588.1	471.3	116.8	308.1	190.8	117.3	618.0	461.1	156.9
India	185.2	160.7	24.5	33.4	32.3	1.1	128.1E	95.2E	32.9E
Italy	1,624.6	1,166.5	458.1	969.6	621.1	348.5	346.6	268.3	78.3
Japan	6,872.3	5,337.1	1,535.2	3,063.4	2,157.6	905.8	272.3	197.3	75.0
Netherlands	NA	NA	NA	113.9	65.7	48.2	225.3	152.2	72.7
Spain	396.3	307.6	88.7	178.7	142.5	36.2	105.8	61.3	44.5
Sweden	226.6	146.6	80.0	164.7	99.7	65.0	229.4	173.5	55.9
Switzerland	1,223.0	1,095.7	127.3	1,079.6	960.6	119.0	313.0	NA	NA
United Kingdom	539.9	444.1(a)	95.8(a)	394.4	291.2	103.2	544.1	442.9	101.2
United States	2,747.0	1,962.0	785.0	617.0	370.0	247.0	2,252.0	1,654.0	598.0
West Germany	5,185.9	3,743.9	1,441.9	3,079.8	2,011.5	1,068.3	1,050.0	778.3	271.7

E - Estimate. NA - Not Available.

(a) NC metal forming data is included with metal cutting data.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools

PRODUCTION OF COMPLETE METAL CUTTING MACHINE TOOLS

Selected Countries, 1986

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Belgium	$ 36.3	NA	NA	NA	NA	NA	NA	NA
France	471.3	$ 0.3(d)	$ 6.6(d)	$ 0.0	$ 29.3	$ 119.5	$ 94.3	$ 221.2(g)
India	160.7	6.7	11.0	4.6	23.6	53.3	17.8	43.7
Italy	1,166.5	43.8	25.5	23.1	100.6	199.3	149.7	624.5
Japan	5,337.1	133.5	92.6	97.2(a)	689.5	1,266.0	307.2	2,751.0
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA
Spain	307.6	12.9	12.9	0.0	28.3	70.6	103.0	79.9
Sweden E	146.6	41.3(b)	(b)	0.0	67.1	36.9	(b)	1.3
Switzerland	1,095.7	NA	NA	NA	NA	NA	NA	NA
United Kingdom (h)	444.0(c)	5.7(d)	3.8(d)	(f)	51.9(d)	106.1	18.9(d)	257.6(e)
United States	1,962.0	84.0	40.0	57.0	420.0	262.0	161.0	938.0
West Germany	3,743.9	129.9	93.0	186.0	669.1	839.1	567.8	2,259.0

E - Estimate. NA - Not available.

(a) NC gear cutting data is included in "Other Metal Cutting."
(b) Drilling machines and milling machines are included in "Boring Machines."
(c) Includes metal forming NC machines.
(d) NC machines are included in "Other Metal Cutting."
(e) Includes all metal cutting and metal forming NC machines except lathes. Also includes gear cutting and finishing machines.
(f) Data is included in "Other Metal Cutting."
(g) Includes NC boring and drilling machines.
(h) Data excludes estimates for companies employing less than 35 people.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools

PRODUCTION OF COMPLETE METAL FORMING MACHINE TOOLS

Selected Countries, 1986

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Belgium	$ 114.8	NA	NA	NA
France	116.8	$ 32.2	$ 47.6	$ 37.0
India	24.5	1.9	15.7	6.9
Italy	458.1	47.0	110.7	300.4
Japan	1,535.2	99.0(a)	1,299.2	137.0
Netherlands	NA	NA	NA	NA
Spain	88.7	3.9	28.7	56.1
Sweden	80.0	10.8	27.0	42.3
Switzerland	127.3	NA	NA	NA
United Kingdom (b)	95.8(c)	0.0	12.2	83.6
United States	785.0	194.0(d)	293.0	298.0
West Germanv	1,441.9	300.7	567.3	573.8

NA - Not available.

(a) Includes only shearing machines.
(b) Data excludes estimates for companies employing less than 35 people.
(c) All metal forming NC machine are included in "Other Metal Cutting (see page 169)"
(d) Data includes bending and forming machines.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools

IMPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS
Selected Countries, 1986
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Belgium	$ 222.5	$ 5.3	$ 6.5	$ 4.1	$ 23.2	$ 27.9	$ 23.9	$131.6
France	461.1	31.0	21.7	9.8	80.3	112.5	58.5	147.4
India (E)	95.2	15.5	2.2	8.7	19.4	9.9	9.1	30.3
Italy	268.3	9.5	16.2	7.7	29.2	73.5	38.2	94.1
Japan	197.3	5.9	2.9	28.4	89.4	30.4	11.2	29.0
Netherlands	152.2	8.6	10.2	0.8	22.0	38.4	33.1	39.2
Spain	61.3	1.0	2.7	1.5	13.7	14.8	3.1	24.4
Sweden (E)	173.5	42.1(a)	(a)	0.8	25.5	46.9	(a)	58.1
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	442.9	21.2	16.3(b)	7.0	69.3(b)	119.7	32.2	177.1
United States	1,654.0	149.0(c,d)	43.0(c,d)	33.0(c)	217.0(c,d)	402.0(c,d)	127.0(c,d)	683.0(c)
West Germany	778.3	54.8	55.7	9.7	141.8	204.9	135.9	175.5

E - Estimate. NA - Not available.

(a) Drilling machines and milling machines are included in "Boring Machines."
(b) Excludes Taiwan; probable misclassification.
(c) Data for machines valued less than $2,500 is included in "Other Metal Cutting."
(d) Does not included NC data for used and rebuilt machines.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools

IMPORTS OF COMPLETE METAL FORMING MACHINE TOOLS
Selected Countries, 1986
(Millions of U.S. Dollars)

Co[illegible]	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Belgiu[illegible]	$ 59.1	$19.2	$ 9.7	$ 30.1
France	156.9	41.1	42.5	73.3
India (E)	32.9	1.2	9.9	21.8
Italy	78.3	13.3	23.3	41.7
Japan	75.0	5.8	19.7	49.6
Netherlands	72.7	28.2	17.1	27.3
Spain	44.5	7.2	9.1	28.3
Sweden (E)	55.9	23.4	8.8	23.6
Switzerland	NA	NA	NA	NA
United Kingdom	101.2	24.0(a)	20.3(a)	56.8
United States	598.0	89.0(b)	234.0(b,c)	275.0(b,c)
West Germany	271.7	44.2	71.8	155.7

E - Estimate. NA - Not Available.

(a) Excludes Taiwan; probable misclassification.
(b) Data for machines valued less than $2.500 is included in "Other Metal Forming."
(c) NC data is included in "Other Metal Forming."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools

EXPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS

Selected Countries, 1986

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Belgium	$ 161.4	$ 8.3	$ 1.9	$ 6.9	$ 7.1	$ 15.8	$ 17.3	$103.9
France	190.8	9.0	22.8	1.0	28.0	57.0	40.0	33.1
India	32.3	1.7	.2	0.0	10.8	11.5	4.0	4.0
Italy	621.1	43.9	32.3	6.5	86.4	77.1	148.0	226.9
Japan	2,157.6	59.5	105.9	18.9(a)	219.8	680.0	98.7	974.8(b)
Netherlands	65.7	10.2	6.5	0.0	29.0	7.3	4.9	7.8
Spain	142.5	9.1	7.4	0.1	14.2	25.0	65.7	21.0
Sweden (E)	99.7	24.7(c)	(c)	0.3	43.1	28.8	c	2.8
Switzerland	960.6	NA	NA	NA	NA	NA	NA	NA
United Kingdom	291.2	21.1	9.6	3.3	55.8	84.0	41.2	76.2
United States	370.0	55.0(d,e)	17.0(d,e)	37.0(d)	75.0(d,e)	68.0(d,e)	28.0(d,e)	90.0(d)
West Germany	2,011.5	154.3	60.8	66.8	488.1	453.1	313.6	474.8

E - Estimate. NA - Not available.

(a) NC machines are included in "Other Metal Cutting."
(b) Includes NC gear cutting and finishing machines.
(c) Drilling machines and milling machines are included in boring machines.
(d) Data for machines valued less than $2,500 is included in "Other Metal Cutting."
(e) Does not include NC data for used and rebuilt machines.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools.

EXPORTS OF COMPLETE METAL FORMING MACHINE TOOLS

Selected Countries, 1986

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Belgium	$ 101.9	$ 22.3	$ 45.1	$ 34.5
France	117.3	19.5	23.0	74.8
India	1.1	0.1	0.8	0.2
Italy	348.5	44.7	101.0	202.9
Japan	905.8	125.8	579.7	200.3
Netherlands	48.2	13.1	11.0	24.1
Spain	36.2	7.1	13.5	15.6
Sweden	65.0	16.3	24.4	24.3
Switzerland	119.0	NA	NA	NA
United Kingdom	103.2	15.9	30.5	56.7
United States	247.0	22.0(a)	64.0(a)	161.0
West Germany	1,068.3	189.7	251.4	627.2

NA - Not available.

(a) Data for machines valued less than $2,500 is included in "Other Metal Forming."

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics of Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1977	$4,855	100.0%	$458	9.4%	$1,772	36.5%	$ 611	12.6%	$496	10.2%	$437	9.0%	$323	6.7%	$269	5.5%	$123	2.5%
1978	6,279	100.0	585	9.3	2,086	33.2	1,017	16.2	659	10.5	598	9.5	426	6.8	383	6.1	139	2.2
1979	7,440	100.0	685	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.3	474	6.4	459	6.2	176	2.4
1980	7,307	100.0	572	7.8	2,211	30.3	1,388	19.0	793	10.9	618	8.5	590	8.1	426	5.8	NA	NA
1981	7,130	100.0	904	13.1	1,924	27.0	1,618	22.7	672	9.4	569	8.0	491	6.9	314	4.4	NA	NA
1982	5,846	100.0	567	9.7	1,679	28.7	1,203	20.6	647	11.1	437	7.5	406	6.9	236	4.0	NA	NA
1983	4,997	100.0	355	7.1	1,440	28.8	1,178	23.6	603	12.1	426	8.5	263	5.3	242	4.8	NA	NA
Industrial Countries																		
United States																		
1977	$ 422	100.0%	—	—	$ 106	25.0%	$ 111	26.4%	$ 35	8.3%	$ 17	4.1%	$ 47	11.0%	$10	2.5%	$ 18	4.2%
1978	678	100.0	—	—	166	24.6	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	25	3.7
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.9	26	2.6	32	3.3
1980	1,196	100.0	—	—	220	18.4	515	43.1	87	7.2	47	3.9	123	10.4	26	2.2	31	2.4
1981	1,373	100.0	—	—	165	12.0	746	54.3	74	5.4	34	2.5	142	10.3	24	1.7	NA	NA
1982	1,094	100.0	—	—	148	13.5	514	47.0	66	6.0	32	2.9	105	9.6	9	.9	NA	NA
1983	799	100.0	—	—	101	12.7	407	50.9	57	7.2	28	3.4	52	6.5	15	1.9	NA	NA
West Germany																		
1977	290	100.0	$ 25	8.5%	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	37	9.6	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.5	71	13.2	32	5.9	48	9.0	18	3.3
1980	612	100.0	27	4.4	—	—	108	17.6	192	31.3	80	13.0	47	7.6	46	7.6	NA	NA
1981	515	100.0	33	6.4	—	—	93	18.1	144	28.0	80	15.6	37	7.1	33	6.5	NA	NA
1982	383	100.0	23	6.1	—	—	54	14.2	135	35.2	49	12.9	21	5.5	24	6.2	NA	NA
1983	348	100.0	28	7.9	—	—	60	17.1	127	36.4	42	12.1	14	4.1	19	5.3	NA	NA

Note: Footnotes on final page of table.

(Continued)

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1977	$256	100.0%	$ 11	4.3%	$135	52.8%	$ 2	.9%	$33	12.9%	$38	14.8%	$17	6.5%	—	—	$ 3	1.1%
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.0	58	17.0	55	16.0	22	6.4	—	—	6	1.6
1980	419	100.0	18	4.2	166	39.5	31	7.3	59	14.1	69	16.4	34	8.0	—	—	—	—
1981	393	100.0	26	6.6	161	41.0	27	6.9	49	12.6	67	17.2	21	5.2	—	—	NA	NA
1982	332	100.0	18	5.5	137	41.4	23	6.8	46	13.7	54	16.2	18	5.5	—	—	NA	NA
1983	330	100.0	12	3.5	155	47.0	15	4.6	42	12.7	63	19.2	18	5.4	—	—	NA	NA
United Kingdom																		
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	$13	6.0%	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	36	10.1	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
1980	426	100.0	52	12.1	150	35.3	69	16.1	43	10.0	39	9.3	—	—	19	4.6	NA	NA
1981	328	100.0	60	18.3	111	33.8	54	16.5	34	10.3	25	7.7	—	—	15	4.5	NA	NA
1982	317	100.0	61	19.3	95	30.1	48	15.0	26	8.3	25	7.8	—	—	15	4.6	NA	NA
1983	224	100.0	35	15.8	74	33.1	43	19.1	20	9.1	14	6.1	—	—	11	4.9	NA	NA
Canada																		
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.2	5	2.9
1980	227	100.0	119	52.6	24	18.4	30	13.0	4	1.7	12	5.4	27	11.9	4	1.8	NA	NA
1981	341	100.0	232	68.1	24	12.0	29	8.4	5	1.4	15	4.5	26	7.7	4	1.2	NA	NA
1982	139	100.0	74	53.0	18	13.5	14	9.8	7	5.1	9	6.2	12	8.6	1	.9	NA	NA
1983	92	100.0	48	52.3	12	12.7	14	15.2	2	2.5	4	4.6	6	6.6	2	2.6	NA	NA
Switzerland																		
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.0
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	8	5.2	12	7.9	3	1.9
1980	192	100.0	12	6.0	103	53.7	12	6.2	—	—	23	12.1	17	9.0	14	7.5	NA	NA
1981	171	100.0	8	4.8	90	52.3	14	8.3	—	—	24	14.0	11	6.2	15	8.8	NA	NA
1982	145	100.0	7	4.9	82	56.7	12	8.0	—	—	17	11.4	8	5.4	11	7.8	NA	NA
1983	102	100.0	6	6.3	54	53.3	9	8.4	—	—	12	11.6	6	6.2	8	7.5	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1977	$ 75	100.0%	$23	30.4%	$ 35	47.4%	—	—	$ 8	10.3%	$ 1	1.8%	$ 1	1.6%	$ 2	3.1%	$1	1.9%
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.2	2	1.3	3	1.8
1980	147	100.0	47	32.0	52	35.7	—	—	33	22.4	3	1.7	4	2.9	2	1.4	NA	NA
1981	151	100.0	49	32.5	49	32.2	—	—	41	27.1	2	1.2	3	2.1	1	2.6	NA	NA
1982	146	100.0	50	33.9	48	33.2	—	—	31	20.9	2	1.3	3	2.0	(c)	1.7	NA	NA
1983	105	100.0	36	34.6	28	27.1	—	—	30	28.8	3	2.4	2	1.8	1	.5	NA	NA
Developing Countries																		
Brazil																		
1977	172	100.0	41	23.7	63	36.8	$ 21	12.1%	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	40	18.8	17	7.9	31	14.7	10	4.8	5	2.3	2	1.0
1979	187	100.0	24	13.0	95	50.6	22	11.9	8	4.4	15	7.8	7	3.8	2	1.2	8	4.3
1980	122	100.0	14	11.4	59	48.4	15	12.4	9	7.4	13	10.4	5	3.9	3	2.4	NA	NA
1981	101	100.0	18	18.1	49	48.6	7	7.3	7	6.8	8	8.3	7	6.6	2	2.1	NA	NA
1982	80	100.0	18	23.0	23	28.1	22	26.8	6	7.6	6	7.4	4	4.7	1	.6	NA	NA
1983	45	100.0	10	21.5	13	27.7	11	24.2	3	6.2	7	14.9	1	2.9	(c)	.2	NA	NA
Republic of Korea																		
1977	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
1978	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	NA	NA	8	2.4	7	2.3	NA	NA
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	.4
1980	133	100.0	20	14.8	19	14.5	83	62.5	4	2.7	1	.7	1	.8	3	1.9	NA	NA
1981	71	100.0	14	19.1	10	14.5	38	53.3	5	6.8	(c)	.3	1	2.0	2	2.7	NA	NA
1982	51	100.0	10	20.1	4	7.6	31	60.5	1	2.2	1	2.4	2	4.8	(c)	.8	NA	NA
1983	125	100.0	7	5.9	8	6.4	102	81.6	2	1.9	2	1.8	(c)	.4	1	.7	NA	NA
Spain																		
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.4	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	.6
1980	74	100.0	5	6.3	25	33.5	3	4.2	5	7.0	11	14.3	8	11.0	14	18.5	NA	NA
1981	169	100.0	14	8.1	107	63.0	15	9.1	4	2.6	15	8.7	4	2.3	8	4.6	NA	NA
1982	86	100.0	5	6.1	45	51.9	6	6.4	4	4.9	10	12.2	4	4.5	9	10.5	NA	NA
1983	61	100.0	2	3.3	26	43.2	3	4.4	4	6.0	8	12.6	2	3.3	14	22.2	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switerzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1977	$ 75	100.0%	$ 20	27.1%	$16	21.6%	$ 1	1.4%	$ 3	4.5%	$23	31.0%	$ 3	4.3%	$ 1	1.8%	$1	1.1%
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	3.5	(c)	.5	(c)	.5
1980	44	100.0	12	27.8	12	26.6	1	2.9	1	1.2	14	32.5	1	2.8	1	2.1	(c)	NA
1981	28	100.0	12	43.8	2	8.8	2	7.0	(c)	.6	8	29.3	(c)	1.7	(c)	.5	NA	NA
1982	34	100.0	13	38.0	5	13.5	1	3.7	1	2.2	10	29.6	1	1.7	1	3.4	NA	NA
1983	9	100.0	2	24.5	1	15.2	1	9.3	(c)	.6	4	42.9	(c)	2.1	(c)	3.0	NA	NA
Mexico																		
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.3	4	5.1	4	4.8	1	0.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
1980	207	100.0	89	42.9	49	23.9	17	8.0	7	3.3	10	4.8	14	6.9	5	2.2	NA	NA
1981	360	100.0	225	62.4	37	10.4	18	4.9	6	1.7	23	6.4	11	3.1	15	4.1	NA	NA
1982	277	100.0	112	40.3	34	12.3	64	23.0	4	1.3	6	2.1	22	7.9	6	2.3	NA	NA
1983	153	100.0	30	19.8	14	9.2	17	11.3	2	1.0	9	5.9	8	5.3	70	45.1	NA	NA
Turkey																		
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.7	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.5	1	1.5
1979	40	100.0	2	3.8	13	31.4	NA	NA	5	12.8	6	15.1	4	9.5	8	19.3	NA	NA
1980	45	100.0	(c)	.7	15	33.5	1	3.1	3	6.4	5	10.5	3	6.5	14	32.4	NA	NA
1981	38	100.0	1	3.5	11	27.9	1	2.6	2	4.0	15	39.1	2	4.1	5	14.1	NA	NA
1982	37	100.0	1	2.5	14	38.3	2	6.0	2	4.3	9	23.5	2	6.3	5	13.9	NA	NA
1983	56	100.0	3	5.2	20	35.4	2	4.0	2	2.9	22	39.9	2	4.5	3	5.2	NA	NA
India																		
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	NA	NA
1979	74	100.0	5	6.1	26	34.5	8	10.8	15	20.8	3	4.4	9	12.1	5	6.8	2	2.2
1980	88	100.0	7	8.3	34	39.1	11	12.3	13	14.8	4	4.9	13	15.2	2	1.8	NA	NA
1981	119	100.0	13	11.2	43	35.9	21	17.4	19	15.8	3	2.8	12	10.0	3	2.5	NA	NA
1982	136	100.0	15	10.8	48	35.4	20	14.7	12	8.8	4	2.6	19	14.1	1	.9	NA	NA
1983	113	100.0	4	3.8	39	34.6	34	29.9	13	11.5	4	3.6	12	11.0	2	1.3	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switerzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1977	$ 45	100.0%	$ 8	16.9%	$ 15	34.1%	$ 1	1.8%	$ 2	5.1%	$ 7	14.9%	$ 2	4.1%	$ 9	19.9%	$ 1	1.2%
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.8	1	4.5	(c)	1.3
1979	47	100.0	15	32 7	11	22.5	8	16.3	1	1.8	7	14.2	2	3.9	3	5.6	1	1.2
1980	31	100.0	6	19.3	6	21.0	3	9.7	1	2.1	7	21.4	3	10.9	1	5.2	NA	NA
1981	51	100.0	14	26.4	12	23.5	4	7.6	1	2.5	7	13.1	4	7.3	3	9.3	NA	NA
1982	46	100.0	15	31.7	8	18.0	3	6.2	1	1.4	8	17.5	6	12.1	1	4.7	NA	NA
1983	59	100.0	21	34.8	11	18.4	7	11.6	1	1.5	9	15.8	5	8.1	2	3.2	NA	NA
China																		
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	1	1.7	2	2.8	NA	NA	NA	NA
1979	112	100.0	NA	NA	34	30.7	30	27.0	24	21.1	4	4.0	3	2.4	NA	NA	NA	NA
1980	119	100.0	6	5.2	36	30.5	25	20.8	14	11.7	2	1.5	9	7.1	2	1.4	NA	NA
1981	74	100.0	1	2.0	13	17.2	24	32.4	20	26.7	1	1.6	2	3.1	2	2.6	NA	NA
1982	54	100.0	2	4.2	8	14.2	11	19.9	30	55.5	1	1.0	(c)	.6	1	1.7	NA	NA
1983	63	100.0	13	21.1	9	13.9	10	16.2	23	35.8	3	4.8	4	6.0	(c)	.5	NA	NA
Argentina																		
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	42.0	1	1.0	6	8.2	16	20.6	NA	NA	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	NA	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
1980	61	100.0	11	17.9	14	22.7	2	3.7	6	9.8	19	31.0	4	7.2	3	4.4	NA	NA
1981	50	100.0	7	14.1	16	32.2	2	4.9	4	7.6	7	14.7	4	8.1	4	8.6	NA	NA
1982	27	100.0	7	26.4	8	29.2	1	4.9	4	13.5	3	10.6	1	2.4	3	10.0	NA	NA
1983	14	100.0	1	8.3	5	36.6	3	22.4	(c)	2.6	3	22.3	0	.0	(c)	1.7	NA	NA
Eastern Europe																		
U.S.S.R.																		
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	NA	NA	42	6.7	5	.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7
1980	648	100.0	19	2.9	349	53.8	66	10.1	73	11.3	33	5.1	19	2.9	62	9.5	NA	NA
1981	419	100.0	16	3.8	203	48.4	55	13.1	48	11.5	40	9.6	13	3.0	28	6.8	NA	NA
1982	439	100.0	1	.3	213	48.5	48	10.9	78	17.8	40	9.2	7	1.6	18	4.2	NA	NA
1983	542	100.0	7	1.4	267	49.1	80	14.8	66	12.1	49	9.1	14	2.7	14	2.6	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1977	$203	100.0%	$ 8	4.0%	$54	26.8%	$41	20.1%	$25	12.4%	$21	10.1%	$21	10.4%	$12	5.7%	$6	3.1%
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.7	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	NA	NA	17	9.2	16	8.5	34	17.9	8	4.4	3	1.9
1980	91	100.0	2	1.8	31	34.3	6	6.2	17	18.2	9	9.7	11	11.7	11	11.8	NA	NA
1981	96	100.0	(c)	.0	47	49.4	19	20.2	14	14.7	6	6.7	3	3.4	3	2.6	NA	NA
1982	76	100.0	1	.8	62	81.9	0	.0	6	7.8	3	3.9	1	1.8	(c)	.3	NA	NA
1983	39	100.0	5	13.2	14	37.5	1	3.1	7	17.5	3	7.2	5	11.9	1	1.5	NA	NA
Rumania																		
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
1980	98	100.0	2	1.7	19	19.9	3	3.3	6	5.9	26	27.1	4	4.1	25	25.6	NA	NA
1981	46	100.0	1	3.0	16	35.5	6	13.9	4	8.0	12	25.6	4	7.6	1	2.3	NA	NA
1982	7	100.0	3	44.8	2	22.7	(c)	.9	1	12.3	(c)	2.5	1	15.5	0	.0	NA	NA
1983	18	100.0	(c)	.1	3	17.5	0	.0	1	5.3	8	43.7	(c)	.7	4	23.5	NA	NA
Yugoslavia																		
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	NA	NA	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	1	.5
1980	119	100.0	2	1.6	59	49.3	(c)	.2	16	13.1	24	20.1	4	3.1	12	10.0	NA	NA
1981	77	100.0	3	4.1	40	51.9	4	5.7	13	16.6	9	11.5	2	2.8	3	3.8	NA	NA
1982	87	100.0	1	.7	46	52.5	1	1.1	13	15.2	10	11.5	1	1.2	11	12.8	NA	NA
1983	107	100.0	1	.7	68	63.9	2	1.8	18	16.4	8	7.4	1	.6	4	3.6	NA	NA
Czechoslovakia																		
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	.3	49	64.3	NA	NA	12	15.8	6	7.3	2	2.0	2	3.1	1	.8
1979	82	100.0	NA	NA	54	65.8	1	.6	17	20.8	3	4.0	1	1.2	1	1.7	3	3.2
1980	61	100.0	(c)	.1	33	54.6	1	1.3	10	16.0	8	13.6	2	3.1	4	6.3	NA	NA
1981	39	100.0	1	3.2	25	65.2	(c)	.9	6	15.6	1	3.0	2	4.8	1	2.4	NA	NA
1982	37	100.0	0	.0	17	46.8	2	6.5	10	27.8	1	3.1	1	2.0	2	5.1	NA	NA
1983	42	100.0	1	3.2	27	63.9	1	1.8	9	21.0	1	3.1	(c)	.3	(c)	.4	NA	NA

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)
(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1977	$50	100.0%	$2	3.4%	$32	63.6%	$3	7.0%	$5	10.4%	$1	2.0%	$1	1.7%	$1	1.9%	$1	1.6%
1978	48	100.0	(c)	.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	NA	NA
1979	62	100.0	1	1.8	44	70.9	NA	NA	6	9.1	3	4.3	NA	NA	2	3.1	1	1.5
1980	36	100.0	1	3.7	18	51.5	1	4.0	6	16.9	3	7.6	1	3.8	2	5.1	NA	NA
1981	28	100.0	1	3.3	15	54.4	1	5.1	6	23.5	1	2.1	(c)	.8	(c)	1.0	NA	NA
1982	17	100.0	1	7.5	9	50.2	(c)	.4	3	17.2	2	11.9	(c)	.0	(c)	2.2	NA	NA
1983	21	100.0	0	.0	9	43.1	6	26.8	4	17.6	1	3.4	(c)	.0	1	3.9	NA	NA

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.
(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are - United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.
(c) Less than $500,000.
(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports," Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL CUTTING						
01	For fissionable material, NC	$ 516	$ 0	$ 2	$ 0	$ 195	$ 0
03	For fissionable material, not NC	50	0	0	49	0	0
05	Electro erosion, electric, ultrasonic, NC	151,008	70,048	29,630	22,913	8,126	10,354
07	Electro erosion, electric, ultrasonic, not NC	31,688	7,827	6,910	9,215	3,208	2,343
12	Center and copying multiple tool lathes, NC	170,710	46,729	34,602	11,962	16,650	40,166
14	Automatic and turret lathes, NC	171,247	61,921	28,086	18,667	15,316	29,564
16	Automatic and revolving lathes, not parallel, multiple tool, NC	96,513	20,454	15,824	21,003	9,402	21,724
22	Center and copying lathes, multiple tool, not NC	71,024	32,194	10,813	3,183	8,792	9,451
24	Automatic and turret lathes, not NC	80,442	26,666	16,467	10,436	2,905	18,505
26	Automtic and turret lathes, not parallel, multiple tool, not NC	51,527	17,719	7,002	8,477	13,428	0
36	Boring-milling machines, horizontal, NC	89,356	39,802	19,995	3,298	6,937	12,166
37	Boring machines, not boring-milling, NC	18,175	5,859	5,624	924	2,790	2,643
38	Boring-milling, horizontal, not NC	22,106	6,999	4,754	2,730	1,766	4,222
39	Boring machines, not boring-milling, not NC	12,465	2,550	800	2,511	2,462	2,161
41	Planing machines, NC	597	79	21	100	378	0
43	Planing machines, not NC	1,777	488	215	25	494	219
44	Shaping & slotting, broaching, sawing, NC	9,034	2,711	598	333	83	4,017
45	Shaping & slotting, not NC	3,716	443	415	588	426	1,472
46	Broaching machines, not NC	10,344	746	5,297	31	352	3,253
47	Sawing and cut-off machines, not NC	85,008	17,415	16,252	11,951	12,035	13,881
48	Milling machines, NC	220,657	93,549	37,416	23,019	31,907	17,561
49	Radial drilling machines, NC	7,092	2,436	786	299	598	2,416
51	Piercing machines, not drilling, NC	72,734	35,916	11,932	12,640	4,593	5,120
52	Milling machines, not NC	130,021	42,578	21,152	15,303	25,345	14,427
53	Radial drilling machines, not NC	11,026	3,844	1,790	1,010	2,598	1,177
54	Other drilling machines	47,141	13,464	7,490	2,257	9,097	9,153
55	Cylindrical and surface grinding machines (micrometric), NC	85,906	25,952	17,736	13,064	7,610	18,068
56	Grinding, honing, polishing, lapping (micrometric), NC	36,449	19,150	5,951	2,516	5,058	1,246
57	Surface grinding machines, plane surface (micrometric), not NC	34,791	8,083	7,707	2,445	6,109	6,935
58	Surface grinding machines, cylindrical surface (micrometric), not NC	66,617	25,481	11,509	3,583	4,511	15,812
59	Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	67,604	21,375	8,229	10,257	8,083	15,516
61	Grinding, honing, polishing, lapping, (micrometric), nut NC	54,089	16,930	3,980	7,555	3,659	17,593
62	Grinding, honing, polishing, lapping (not micrometric), NC	15,583	9,337	3,460	1,456	653	0
63	Grinding, honing, polishing, lapping (not micrometric), not NC	68,171	16,187	21,885	7,504	9,867	3,033
64	Jig boring & milling machines, NC	235,771	60,260	20,007	1,784	134,895	9,202
65	Jig boring & milling machines, not NC	8,791	2,167	365	1,837	1,093	2,577
66	Gear cutting machines, cylindrical, NC	9,671	0	3,736	412	2,719	2,175
68	Gear cutting machines, cylindrical, not NC	11,438	1,155	2,518	2,471	473	4,153
69	Gear cutting machines, noncylindrical, NC	4,881	0	2,286	622	749	0
71	Gear cutting machines, noncylindrical, not NC	16,236	8,519	1,287	4,227	1,072	620
93	Screwing and tapping machines by cutting	16,399	2,140	2,958	1,753	2,618	3,931
94	Other metal cutting machines	240,209	12,430	65,094	8,670	7,536	129,658
	Total Imports, cutting (EEC)	$2,538,580	$781,603	$462,581	$253,080	$376,588	$456,514

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)
(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 34,264	$ 11,515	$ 3,505	$ 5,715	$ 6,108	$ 2,534
75 Presses, NC, other than 8445.81, 82, 88	23,713	7,421	5,081	4,135	1,601	3,839
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	50,388	19,649	7,414	2,115	7,912	6,959
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83 87, 89	28,156	19,030	2,722	3,029	307	1,811
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83 87, 89	69,789	14,300	23,602	8,394	10,974	5,211
81 Rolling, bending, folding and planing machines, NC	50,164	20,903	5,222	2,134	8,679	5,924
82 Shearing, punching and stamping, NC	102,771	17,120	26,151	9,464	21,589	12,959
83 Rolling, bending, folding and planing machines, not NC	40,102	11,341	5,236	2,491	6,846	9,256
84 Rolling, bending, folding and planing, not flat products, not NC	47,351	9,262	10,602	4,053	10,432	5,963
85 Hydraulic shearing machines, not NC	35,449	9,753	6,501	795	10,232	5,375
86 Nonhydraulic shearing machines, not NC	24,699	5,207	4,861	1,548	7,275	2,543
87 Punching and stamping machines, not NC	34,715	13,660	3,671	1,490	8,289	3,161
88 Forging and stamping, NC	7,967	526	126	92	996	3,049
89 Forging and stamping, not NC	21,506	6,074	2,805	1,322	1,322	1,051
92 Forming by drawing, bars, tubes, wire etc.	15,600	2,990	1,503	3,517	4,104	2,056
95 Screwing and tapping machines not by cutting	8,420	2,295	1,409	2,006	487	1,186
96 Other metal forming machines for working flat products	14,002	3,247	5,355	723	1,668	2,723
97 Other machines for working wire	51,946	15,277	13,475	4,734	4,315	6,328
Total imports, forming (EEC)	$ 661,002	$189,570	$129,241	$ 57,759	$113,136	$ 81,928
98 MACHINE TOOLS NEC	152,743	26,169	27,999	37,148	19,374	19,835
Grand Total	$3,352,325	$997,342	$619,821	$347,987	$509,098	$558,277

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 18	$ 0	$ 13	$ 0	$ 0	$ 0
03 For fissionable material, not NC	58	48	0	2	0	0
05 Electro erosion, electric, ultrasonic, NC	53,897	34,985	5,706	400	583	3,328
07 Electro erosion, electric, ultrasonic, not NC	23,664	13,559	1,144	1,439	1,384	2,973
12 Center and copying multiple tool lathes, NC	116,710	94,713	1,642	6,315	6,653	5,461
14 Automatic and turret lathes, NC	219,491	193,519	9,482	2,293	3,686	8,439
16 Automatic and revolving lathes, not parallel, multiple tool, NC	87,993	42,371	5,178	27,342	2,436	7,079
22 Center and copying lathes, multiple tool, not NC	100,473	32,796	8,681	8,540	5,773	35,710
24 Automatic and turret lathes, not NC	111,089	57,032	6,685	13,351	1,413	26,745
26 Automtic and turret lathes, not parallel, multiple tool, not NC	89,562	35,107	25,504	19,527	3,447	461
36 Boring-milling machines, horizontal, NC	159,294	113,636	3,782	20,897	8,768	11,542
37 Boring machines, not boring-milling, NC	35,866	18,526	1,199	5,549	9,159	758
38 Boring-milling, horizontal, not NC	28,047	3.543	890	8,211	132	7,039
39 Boring machines, not boring-milling, not NC	36,333	19,147	3,160	9,453	368	1,649
41 Planing machines, NC	1,157	8	21	922	114	65
43 Planing machines, not NC	3,322	1,455	165	1,313	99	221
44 Shaping & slotting, broaching, sawing, NC	10,228	5,016	125	1,263	93	3,713
45 Shaping & slotting, not NC	7,225	1,697	982	1,330	62	1,740
46 Broaching machines, not NC	21,365	15,236	65	3,436	575	1,942
47 Sawing and cut-off machines, not NC	144,005	78,952	9,490	36,001	5,959	7,754
48 Milling machines, NC	358,039	233,753	18,125	65,506	2,517	24,631
49 Radial drilling machines, NC	2,890	295	186	1,333	72	829
51 Piercing machines, not drilling, NC	69,832	36,384	14,425	13,844	3,648	1,142
52 Milling machines, not NC	277,767	81,243	21,959	83,000	19,901	16,589
53 Radial drilling machines, not NC	11,769	2,491	956	2,673	1,269	1,772
54 Other drilling machines	61,890	21,899	7,249	14,612	3,595	6,446
55 Cylindrical and surface grinding machines (micrometric), NC	115,166	82,581	1,087	17,063	1,818	11,735
56 Grinding, honing, polishing, lapping (micrometric), NC	70,948	62,928	234	3,759	2,684	1,238
57 Surface grinding machines, plane surface (micrometric), not NC	105,756	70,727	1,494	14,974	634	8,996
58 Surface grinding machines, cylindrical surface (micrometric), not NC	83,891	50,713	2,353	5,398	1,445	16,633
59 Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	117,733	32,040	7,855	49,301	16,981	8,142
61 Grinding, honing, polishing, lapping, (micrometric), not NC	145,706	119,986	2,519	10,271	1,153	8,579
62 Grinding, honing, polishing, lapping (not micrometric), NC	8,097	4,145	711	2,324	187	0
63 Grinding, honing, polishing, lapping (not micrometric), not NC	129,158	66,862	11,786	29,727	11,019	506
64 Jig boring & milling machines, NC	170,785	38,003	160	30,442	100,856	595
65 Jig boring & milling machines, not NC	6,519	3,663	249	1,584	103	623
66 Gear cutting machines, cylindrical, NC	24,378	23,057	210	548	0	563
68 Gear cutting machines, cylindrical, not NC	28,081	24,502	430	1,148	244	1,693
69 Gear cutting machines, noncylindrical, NC	4,155	3,554	0	430	0	171
71 Gear cutting machines, noncylindrical, not NC	28,506	15,885	408	4,410	6,849	835
93 Screwing and tapping machines by cutting	24,764	11,590	1,230	1,925	2,241	1,185
94 Other metal cutting machines	368,078	272,342	13,722	24,017	483	50,804
Total Imports, cutting (EEC)	$3,463,705	$2,019,989	$191,262	$545,873	$228,403	$290,326

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986

(Thousands of U.S. Dollars)
(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 24,100	$ 6,726	$ 2,245	$ 6,736	$ 3,391	$ 3,932
75 Presses, NC, other than 8445.81, 82, 88	22,857	5,010	481	3,860	5,108	8,205
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	170,060	94,360	7,224	25,171	22,941	10,485
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83 87, 89	46,279	28,493	122	6,714	9,788	934
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83 87, 89	225,011	118,189	12,881	58,775	14,934	6,959
81 Rolling, bending, folding and planing machines, NC	43,158	16,936	4,120	5,555	6,049	5,957
82 Shearing, punching and stamping, NC	141,728	108,483	3,518	15,174	5,464	7,525
83 Rolling, bending, folding and planing machines, not NC	125,396	75,722	8,004	15,897	13,251	8,020
84 Rolling, bending, folding and planing, not flat products, not NC	74,937	24,324	11,753	17,662	9,570	5,966
85 Hydraulic shearing machines, not NC	66,069	27,112	8,563	3,726	17,393	1,950
86 Nonhydraulic shearing machines, not NC	71,479	34,490	5,301	21,787	2,445	4,132
87 Punching and stamping machines, not NC	44,381	23,177	2,113	4,167	10,255	2,328
88 Forging and stamping, NC	8,992	7,166	1	734	438	553
89 Forging and stamping, not NC	39,261	19,797	816	12,310	4,074	1,191
92 Forming by drawing, bars, tubes, wire etc.	80,750	52,457	774	20,760	587	5,313
95 Screwing and tapping machines not by cutting	16,343	8,761	1,804	3,237	612	803
96 Other metal forming machines for working flat products	51,487	40,249	3,361	5,876	935	906
97 Other machines for working wire	77,428	53,904	3,271	9,713	3,368	4,692
Total imports, forming (EEC)	$1,329,716	$ 745,356	$ 76,352	$237,854	$130,603	$ 79,851
98 MACHINE TOOLS NEC	354,150	72,607	41,205	189,195	20,097	23,286
Grand Total	$5,147,571	$2,837,952	$308,819	$972,922	$379,103	$393,463

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

Selected Countries

(Thousands of U.S. Dollars)

Countries	Total EEC	France	Belgium	Netherlands	West Germany	Italy	United Kingdom
EUROPE	$3,045,048	$497,471	$153,636	$193,572	$ 758,676	$299,006	$332,908
France	125,061	0	11,663	6,094	45,777	16,012	12,872
Belgium	90,511	22,033	0	12,258	24,502	13,836	5,610
Netherlands	64,022	4,676	16,242	0	21,619	2,724	6,227
West Germany	1,099,809	183,201	71,410	104,728	0	127,141	164,503
Italy	423,151	120,102	17,257	13,472	134,756	0	33,765
United Kingdom	139,910	26,488	5,258	7,968	38,854	18,377	9,047
Denmark	24,327	1,592	377	1,723	8,412	546	2,310
Portugal	4,599	127	56	541	544	12	2,277
Spain	99,066	17,616	3,658	7,155	30,932	5,970	12,661
Sweden	82,822	6,549	2,396	4,800	23,529	9,051	18,548
Switzerland	646,447	91,405	13,868	22,534	338,506	72,532	45,730
Austria	78,999	4,914	600	3,484	45,308	6,507	4,805
Other Europe	34,023	1,227	4,218	946	10,234	3,139	5,416
Ireland	9,536	270	1,889	260	2,175	1,141	2,299
Norway	3,063	445	51	122	825	42	302
Finland	9,336	347	10	253	1,521	513	2,442
Yugoslavia	10,525	163	2,267	258	5,154	981	146
Eastern Europe	132,116	17,540	6,632	7,868	35,703	23,160	9,138
U.S.S.R.	20,996	1,405	1,030	745	5,601	6,418	858
East Germany	31,374	7,270	3,302	1,787	25,591(a)	7,467	3,781
Czechoslovakia	43,709	3,364	1,852	4,007	14,223	5,084	3,307
Hungary	12,898	925	122	285	7,041	749	129
AFRICA	2,599	16	553	171	766	304	606
South Africa	2,502	0	553	161	722	292	605
AMERICA	236,891	30,769	17,285	6,543	45,078	13,953	104,234
United States	199,677	30,428	16,915	6,364	40,909	12,699	74,027
Canada	31,611	259	370	161	291	502	29,673
Mexico	76	0	0	0	26	50	0
Nicaragua	162	0	0	0	0	0	0
Columbia	54	0	0	0	54	9	0
Brazil	4,811	82	0	18	3,796	348	516
Argentina	342	0	0	0	0	342	0
ASIA	781,401	86,439	109,421	25,036	244,879	31,388	120,976
Israel	2,990	39	4	4	2,316	84	120
Other Near East	1,380	69	196	22	934	102	54
India	1,830	13	60	14	1,128	20	474
Singapore	2,726	2	0	452	1,256	11	630
China	6,609	703	0	48	4,949	251	150
South Korea	7,036	493	378	237	3,848	63	1,498
Japan	706,840	77,679	106,764	20,813	216,259	28,184	107,192
Taiwan	51,230	7,434	2,020	3,445	14,070	2,641	10,681
AUSTRALIA & OCEANA	645	0	0	6	275	23	291
Australia	490	0	0	6	249	23	206
OTHER	7,055	4,939	39	0	0	1,352	0
TOTAL	$4,073,641	$619,634	$280,935	$225,328	$1,049,674	$346,025	$559,015

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1986

Selected Countries

(Thousands of U.S. Dollars)

Countries	Denmark	Portugal	Spain	Sweden	Switzerland	Austria
EUROPE	$ 95,963	$28,735	$ 83,973	$164,796	$254,131	$182,181
France	2,010	1,147	6,056	2,736	17,614	3,081
Belgium	2,454	290	1,280	3,477	3,190	1,583
Netherlands	1,287	55	438	4,185	3,860	2,711
West Germany	47,795	6,003	34,035	77,296	168,078	115,619
Italy	8,814	8,197	19,093	15,474	35,011	17,209
United Kingdom	5,287	1,658	6,755	8,693	7,019	4,506
Denmark	0	78	792	6,472	1,563	461
Portugal	235	0	466	114	186	41
Spain	2,321	7,584	0	5,812	2,928	2,629
Sweden	9,996	37	884	0	3,740	3,290
Switzerland	10,226	1,971	8,879	21,035	0	19,760
Austria	1,033	27	397	6,277	5,647	0
Other Europe	1,225	291	342	4,799	846	1,341
Ireland	813	0	31	0	404	256
Norway	41	261	26	710	236	1
Finland	114	28	75	3,836	148	48
Yugoslavia	257	1	176	253	20	848
Eastern Europe	3,279	1,397	4,555	8,441	4,450	9,952
U.S.S.R.	535	218	1,283	709	1,522	672
East Germany	516	330	1,942	1,845	380	2,754
Czechoslovakia	1,301	228	866	4,218	1,972	3,288
Hungary	525	17	3	288	496	2,318
AFRICA	0	0	9	0	175	0
South Africa	0	0	1	0	168	0
AMERICA	1,384	1,334	5,364	4,273	5,393	1,282
United States	1,384	1,254	5,036	4,066	5,325	1,267
Canada	0	77	85	158	27	7
Mexico	0	0	0	0	0	0
Nicaragua	0	0	162	0	0	0
Columbia	0	0	0	0	0	0
Brazil	0	3	0	0	41	8
Argentina	0	0	74	0	0	0
ASIA	32,790	788	16,163	45,663	53,460	14,398
Israel	0	2	186	0	233	1
Other Near East	0	0	0	0	2	0
India	0	17	0	0	124	0
Singapore	0	0	6	0	369	0
China	249	3	0	167	1	90
South Korea	408	0	0	0	103	8
Japan	29,004	458	15,622	43,037	48,684	13,144
Taiwan	3,129	309	345	2,068	3,934	1,155
AUSTRALIA & OCEANA	0	0	1	45	4	65
Australia	0	0	1	0	4	0
OTHER	720	5	0	0	0	0
TOTAL	$130,856	$30,862	$105,509	$214,776	$313,164	$197,862

(a) Since sales by the German Democratic Republic to the Federal Republic of Germany are not considered as imports, these figures are not included in totals and subtotals.

Note: Individual items may not add to totals due to rounding.

Source: CECIMO Comite Europeen de Cooperation des Industries de la Machine-Outil.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986

Selected Countries

(Thousands of U.S. Dollars)

Countries	Total EEC	France	Belgium	Netherlands	West Germany	Italy	United Kingdom
EUROPE	$4,403,883	$175,001	$192,437	$80,815	$1,908,101	$607,606	$175,419
France	543,334	0	51,807	6,550	214,851	118,438	27,578
Belgium	162,077	13,225	0	16,810	81,511	21,732	7,622
Netherlands	197,998	5,334	12,505	0	118,412	15,038	10,192
West Germany	767,884	39,283	67,048	25,063	0	139,482	44,941
Italy	280,468	19,055	12,580	3,027	135,498	0	15,949
United Kingdom	363,112	16,656	17,024	7,961	187,248	42,614	0
Denmark	92,539	1,337	3,132	1,316	47,109	8,328	4,548
Portugal	30,659	2,045	493	142	7,450	9,413	1,222
Spain	79,466	6,376	1,077	968	31,448	19,849	6,060
Sweden	186,252	3,897	3,657	4,512	99,784	19,029	10,650
Switzerland	279,007	18,041	2,053	4,366	187,691	41,458	10,531
Austria	222,500	3,174	1,778	2,186	166,759	18,469	2,627
Other Europe	338,497	12,983	6,685	2,268	166,844	52,683	24,240
Norway	59,276	3,988	2,332	630	28,793	3,173	3,015
Finland	64,488	3,491	1,021	767	25,076	9,057	4,762
Yugoslavia	103,963	644	187	14	68,293	13,596	1,419
Turkey	64,094	3,840	1,012	43	30,137	14,269	4,288
Eastern Europe	858,244	33,596	12,597	5,647	463,496	101,073	9,258
U.S.S.R.	511,618	5,509	5,339	2,936	316,290	72,977	3,184
East Germany	39,575	21,662	2,338	63	45,658(a)	1,190	1,455
Poland	61,302	998	970	557	29,357	10,460	1,062
Czechoslovakia	90,181	3,689	1,218	1,126	46,160	3,902	2,117
Bulgaria	119,103	1,601	2,545	875	58,918	10,199	1,163
AFRICA	250,580	50,346	35,285	2,901	55,388	52,767	16,684
South Africa	25,478	862	686	410	10,103	3,664	4,219
AMERICA	1,217,162	52,173	15,690	15,294	565,198	187,970	116,744
United States	886,994	41,137	7,876	14,233	410,082	129,239	94,579
Canada	158,345	6,665	6,526	417	75,439	28,556	17,187
Mexico	45,799	866	48	62	27,629	5,429	1,483
Colombia	9,100	188	141	13	1,996	1,236	387
Venezuela	18,158	464	23	95	5,053	7,027	797
Brazil	50,136	329	205	0	31,290	6,528	948
Argentina	18,817	125	207	81	9,448	4,523	0
ASIA	997,115	24,467	18,188	13,764	513,094	111,693	71,648
Iran	53,328	1	948	2	31,158	7,659	2,749
Israel	38,153	2,065	1,593	153	14,293	8,072	3,967
India	109,161	2,820	1,788	1,366	59,534	8,338	12,993
China	361,847	5,856	7,047	4,877	204,179	47,602	18,186
South Korea	69,932	531	749	342	45,926	3,502	4,233
Japan	175,793	1,528	1,936	2,733	87,307	8,902	4,323
Taiwan	22,670	1,425	317	844	12,095	752	1,118
OCEANA & AUSTRALIA	77,678	6,900	1,085	1,483	32,665	7,364	14,329
Australia	65,585	5,761	1,068	1,473	28,551	6,050	11,648
OTHER	6,268	0	12	11	0	82	0
TOTAL	6,952,687	308,888	262,698	114,269	3,074,445	967,482	394,825

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1986
Selected Countries
(Thousands of U.S. Dollars)

Countries	Denmark	Portugal	Spain	Sweden	Switzerland	Austria
EUROPE	$32,838	$4,379	$110,387	$110,481	$ 882,608	$123,810
France	2,090	101	17,223	5,298	94,467	4,932
Belgium	599	31	3,968	2,135	13,792	654
Netherlands	1,911	206	7,468	4,258	19,800	2,872
West Germany	8,146	333	31,833	24,999	342,791	43,966
Italy	170	6	6,517	9,942	72,970	4,753
United Kingdom	3,942	2,729	12,581	19,825	48,821	3,709
Denmark	0	243	2,901	12,275	10,663	687
Portugal	96	0	7,279	451	2,035	32
Spain	460	484	0	487	11,828	429
Sweden	7,477	101	5,554	0	26,376	5,217
Switzerland	1,768	116	3,060	3,390	0	6,532
Austria	500	11	2,563	3,217	21,218	0
Other Europe	5,195	20	8,904	17,192	37,281	4,201
Norway	3,159	0	1,607	8,849	3,066	664
Finland	1,005	0	3,599	6,933	8,230	547
Yugoslavia	50	0	936	1,410	15,777	1,638
Turkey	306	0	1,173	0	7,978	1,048
Eastern Europe	484	0	536	5,166	180,566	45,826
U.S.S.R.	140	0	442	728	84,910	19,163
East Germany	62	0	0	232	12,537	35
Poland	103	0	40	3,461	12,552	1,742
Czechoslovakia	34	0	38	170	24,509	7,218
Bulgaria	0	0	0	455	42,373	973
AFRICA	4,436	528	8,182	2,100	16,444	5,519
South Africa	143	56	1,284	0	3,714	338
AMERICA	6,357	2,199	44,102	24,856	171,898	14,681
United States	3,661	1,796	20,719	20,851	134,419	8,402
Canada	534	242	3,900	2,876	14,120	1,882
Mexico	381	10	4,066	0	5,385	440
Colombia	334	0	3,692	0	870	243
Venezuela	275	34	3,400	0	841	150
Brazil	319	44	470	0	9,941	62
Argentina	46	54	1,068	0	3,085	79
ASIA	5,838	269	12,216	15,574	180,525	29,839
Iran	553	0	520	0	9,158	579
Israel	204	64	1,558	0	6,015	169
India	646	0	1,546	0	19,485	645
China	977	0	2,201	7,098	51,768	12,056
South Korea	660	0	11	0	13,480	498
Japan	400	0	53	970	53,977	13,664
Taiwan	140	0	129	121	5,574	155
OCEANA & AUSTRALIA	406	31	3,274	1,195	8,437	508
Australia	406	31	2,801	0	7,396	400
OTHER	6,158	0	0	0	0	5
TOTAL	56,034	7,406	178,162	154,205	1,259,912	174,362

(a) Since sales by the German Democratic Republic to the Federal Republic of Germany are not considered as imports, these figures are not included in totals and subtotals.

Note: Individual items may not add to totals due to rounding.

Source: CECIMO Comite Europeen de Cooperation des Industries de la Machine-Outil.

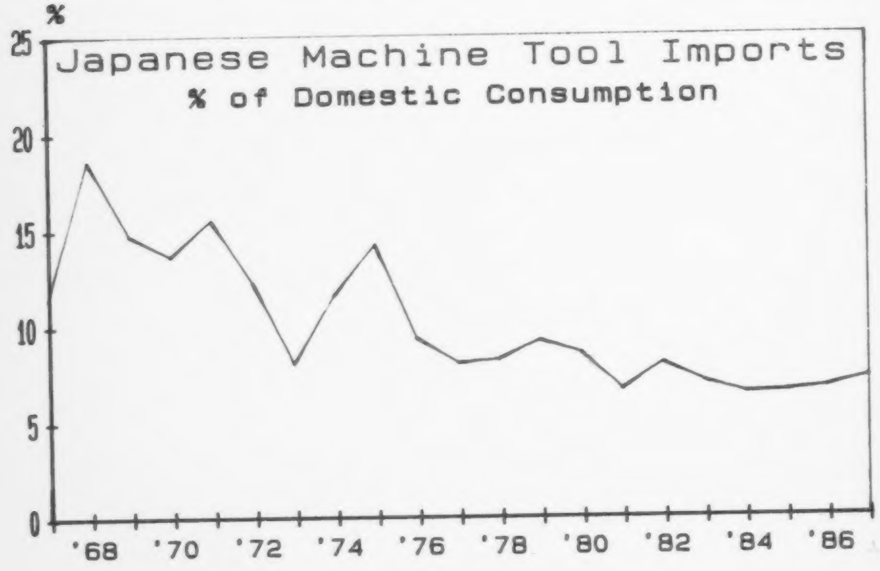
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1967 TO DATE

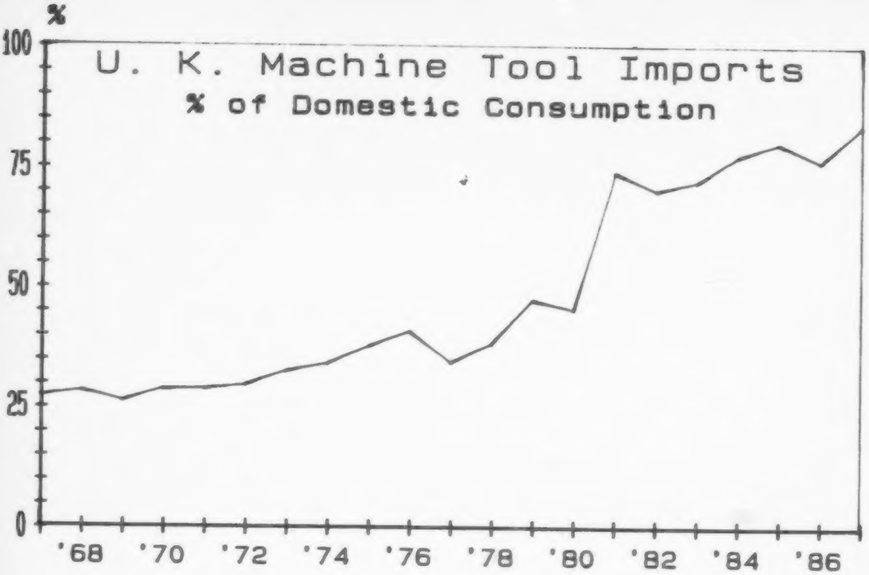
(Percent)

Year	U.S.A.	Japan	United Kingdom	West Germany
1967	10.0%	11.4%	27.2%	16.3%
1968	9.8	18.6	28.3	21.4
1969	9.7	14.7	26.0	22.9
1970	9.5	13.6	28.7	23.8
1971	10.1	15.5	28.8	20.6
1972	10.0	12.2	29.6	22.1
1973	10.3	8.0	32.5	21.3
1974	13.4	11.6	34.1	23.7
1975	14.5	14.2	37.7	27.8
1976	16.1	9.3	40.8	27.7
1977	16.5	8.0	34.2	30.0
1978	21.5	8.2	38.3	29.9
1979	23.3	9.2	47.4	29.8
1980	23.6	8.5	45.3	32.8
1981	25.6	6.6	73.9	28.4
1982	27.4	8.0	70.0	25.4
1983(r)	34.0	7.0	72.0	26.7
1984(r)	39.1	6.4	77.4	32.5
1985(r)	42.5	6.5	80.1	30.1
1986(r)	50.2	6.7	76.1	30.7
1987(p)	49.6	7.2	83.7	27.5

p - Preliminary. r - Revised.

Source: NMTBA and respective machine tool trade associations.




%
U. K. Machine Tool Imports
% of Domestic Consumption
100
75
50
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0
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'72
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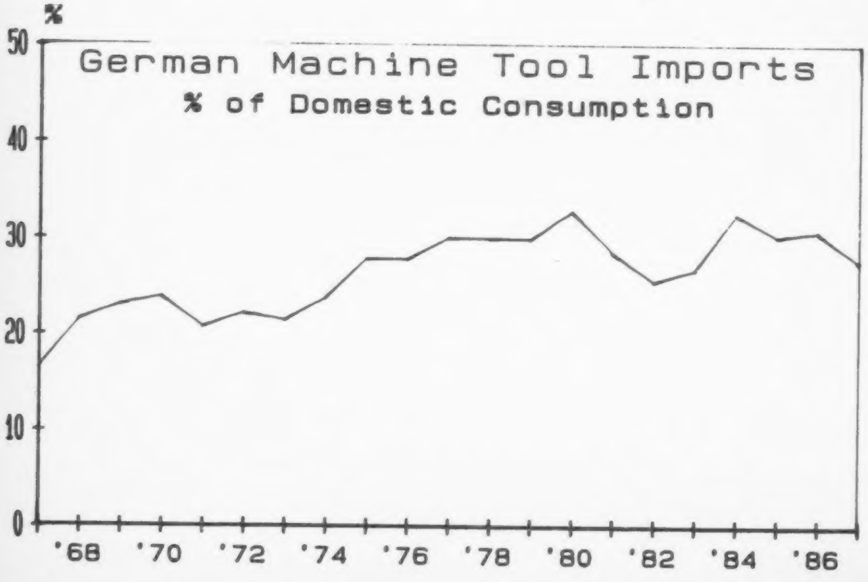
%
German Machine Tool Imports
% of Domestic Consumption
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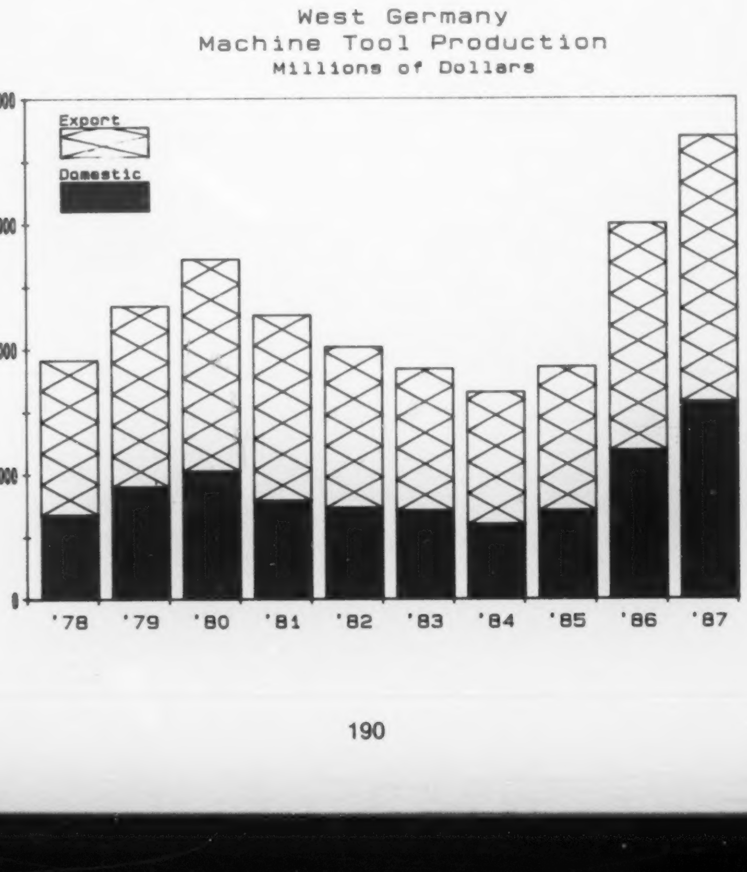
THE GERMAN MACHINE TOOL INDUSTRY (a)

1968 to Date

Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	122,500	49.3	26.7	15,056
1972	117,600	55.7	21.2	15,275
1973	115,500	61.3	15.8	18,815
1974	115,800	69.0	12.8	22,541
1975	109,300	72.7	13.0	25,171
1976	101,400	70.2	9.5	27,283
1977	95,900	69.7	18.7	31,857
1978	94,800	65.0	22.9	40,326
1979	95,000	61.9	26.1	49,378
1980	98,000	62.6	29.2	55,497
1981	97,000	65.6	26.0	46,858
1982	93,000	64.2	24.1	43,377
1983	83,700	62.0	25.7	43,989
1984	83,000	64.1	28.2	39,825
1985	88,000	62.4	33.9	42,185
1986	93,000	60.6	36.8	64,445
1987	93,500	57.6	37.0	78,976

(a) Figures include parts.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."



GERMAN PRODUCTION OF MACHINE TOOLS
1984 to Date
(Values in Thousands of U.S. Dollars)

Machine Classifications	1984		1985		1986		1987	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	157,054	$3,305,498	165,750	$3,712,242	124,884	$5,993,406	126,150	$7,384,244
Metal Cutting Total	88,475	$2,295,207	98,286	$2,594,486	82,354	$4,275,026	78,519	$5,306,989
Planing, Shaping and Broaching	370	15,940	397	21,444	404	27,034	273	27,434
Lathes	6,477	234,255	6,367	239,838	6,892	377,892	6,723	424,738
Turret Lathes, Automatic	2,652	239,810	2,786	285,446	3,274	467,116	2,738	642,193
Boring and Drilling	12,877	77,426	13,380	89,403	15,212	139,058	16,633	152,677
Milling Machines, Horizontal Boring and Milling Machines	8,341	361,992	8,080	407,821	8,883	652,990	8,233	724,039
Saws and Filing Machines	12,434	63,089	14,284	72,681	11,446	112,209	8,856	120,650
Grinding, Honing and Polishing	30,425	321,534	35,602	408,238	16,338	668,729	16,989	850,080
Gear Cutting Machines	690	83,571	923	106,252	1,133	185,960	1,040	233,120
Other Metal Cutting Machine Tools	14,207	575,545	16,467	607,156	18,772	1,112,675	17,024	1,477,648
Parts and Accessories	—	324,043	—	356,208	—	531,364	—	654,410
Metal Forming Total	68,579	1,010,291	67,464	1,117,755	42,530	1,718,379	47,631	2,077,255
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	3,436	96,829	3,564	108,409	4,079	151,562	3,861	210,699
Mechanical Presses	12,077	106,774	11,307	159,361	13,841	267,118	11,342	335,481
Hydraulic Presses	5,517	171,955	1,979	149,927	2,165	255,471	1,931	276,618
Sheet Metalworking Machines, Including Shears	40,699	259,818	42,498	305,475	14,509	467,872	13,998	541,846
Wire Working Machines	6,411	147,602	7,720	174,372	7,526	242,546	15,991	306,937
Bolt, Screw and Nut Making Machines	439	49,591	396	32,591	410	57,121	537	78,254
Parts and Accessories	—	177,721	—	187,620	—	276,690	—	327,420

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1984 $1 = 2.8459 Deutsche Mark; 1985 $1 = 2.9440 Deutsche Mark; 1986 $1 = 2.1715 Deutsche Mark; 1987 $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS

1985 to Date

(Thousands of U.S. Dollars)

	1985		1986		1987	
Machine Classifications	Units	Value	Units	Value	Units	Value
GRAND TOTAL	189,934	$2,315,393	86,936	$3,633,776	82,539	$4,251,586
Metal Cutting Total	159,505	$1,416,448	55,422	$2,282,723	51,260	$2,647,094
Planing, Shaping and Broaching	288	8,812	365	18,324	301	13,577
Lathes	3,175	144,116	2,921	204,210	3,055	272,992
Turret Lathes, Automatic	2,621	164,917	2,528	249,031	2,407	269,401
Drilling	12,206	68,006	10,206	139,878	12,150	157,726
Milling Machines, Horizontal Boring and Milling Machines	6,262	249,830	7,328	430,480	6,726	430,048
Saws and Filing Machines	9,862	57,065	8,985	83,628	7,799	82,296
Grinding, Honing and Polishing	119,573	299,407	17,550	488,128	13,680	581,699
Gear Cutting Machines	545	44,565	554	66,744	587	90,465
Other Metal Cutting Machine Tools	4,973	196,599	4,983	331,144	4,555	427,217
Parts and Accessories	—	183,132	—	271,156	—	321,672
Metal Forming Total	27,927	735,132	28,218	1,100,667	28,227	1,256,212
Hammers, Forging and Riveting Machines Bending and Straightening Machines	3,129	76,539	2,917	57,091	2,783	108,072
Mechanical Presses	4,067	56,263	4,680	122,465	6,104	133,195
Hydraulic Presses	1,828	57,732	1,387	96,262	970	98,842
Sheet Metalworking Machines, Including Shears	8,493	187,703	9,083	286,658	8,908	285,686
Wire Working Machines	5,318	124,056	5,759	193,020	4,907	199,067
Bolt, Screw and Nut Making Machines	551	29,302	536	41,552	461	51,309
Other Metal Forming Machine Tools	4,541	41,723	3,856	72,306	4,094	104,573
Parts and Accessories	—	161,814	—	231,314	—	275,470
Other Metal Working Machines (including Parts and Accessories)(a)	2,502	163,813	3,296	250,386	3,052	348,280

(a) Includes nuclear materials handling machines, presses for treating metals, and industrial plant components.

Exchange rate: 1985 $1 = 2.9440 Deutsche Mark; 1986 $ 1 = 2.1715 Deutsche Mark; 1987 $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

GERMAN IMPORTS OF MACHINE TOOLS

1985 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1985		1986		1987	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	83,345	$785,007	69,292	$1,337,104	66,360	$1,571,812
Metal Cutting Total	64,891	$516,495	49,669	$905,935	45,575	1,042,325
Planing, Shaping and Broaching	126	1,513	156	1,749	98	2,852
Lathes	7,245	65,380	9,322	116,653	7,625	116,093
Turret Lathes, Automatic	1,336	46,987	1,905	88,253	1,876	101,699
Drilling	6,926	67,893	9,145	125,914	12,012	119,337
Milling Machines, Horizontal Boring and Milling Machines	4,640	98,721	7,003	182,235	6,389	184,608
Saws and Filing Machines	6,716	12,630	9,646	20,012	8,678	21,408
Grinding, Honing and Polishing	35,282	84,356	9,379	141,954	5,816	211,526
Gear Cutting Machines	81	7,838	75	9,637	80	17,365
Other Metal Cutting Machine Tools	2,539	55,032	3,038	92,197	3,001	116,175
Parts and Accessories	—	76,145	—	127,332	—	151,261
Metal Forming Total	16,079	218,872	16,776	364,406	17,360	450,148
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	1,944	7,687	1,644	13,339	2,005	19,110
Mechanical Presses	1,455	12,342	2,146	21,639	2,085	26,563
Hydraulic Presses	1,452	15,295	1,260	26,924	1,463	35,791
Sheet Metalworking Machines, Including Shears	4,652	49,603	5,245	77,756	6,122	92,597
Wire Working Machines	2,840	35,050	2,802	51,600	2,683	59,597
Bolt, Screw and Nut Making Machines	309	9,145	465	25,365	309	15,270
Other Metal Forming Machine Tools	3,427	16,656	3,214	26,071	2,693	34,447
Parts and Accessories	—	73,095	—	121,713	—	166,774
Other Metal Working Machines (including Parts and Accessories)(a)	2,375	49,640	2,847	66,763	3,425	79,339

(a) Includes nuclear materials handling machines, presses for treating metals, and industrial plant components.

Exchange rate: 1985 $1 = 2.9440 Deutsche Mark; 1986 $1 = 2.1715 Deutsche Mark; 1987 $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine & By Destination, 1987

(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filling Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$2,325,421	$157,726	$90,645	$581,699	$269,401	$272,992	$430,048	$82,296	$13,577	$427,217
EUROPE	1,558,573	122,138	51,129	332,693	200,251	184,510	313,677	55,238	9,360	289,577
France	175,713	19,653	7,664	33,027	29,311	20,019	32,298	9,065	1,282	23,393
Belgium-Luxembourg	84,522	15,281	2,390	14,135	7,691	6,008	7,959	3,112	132	27,815
Netherlands	71,319	4,695	401	15,990	8,221	9,131	20,150	4,771	122	7,837
Italy	202,692	11,644	11,923	33,957	38,758	14,863	35,624	5,625	1,255	49,044
United Kingdom	133,971	9,370	3,394	21,562	21,792	21,580	21,079	5,354	519	29,321
Ireland	2,865	569	—	1,172	354	24	587	157	—	3
Denmark	30,144	5,215	1,200	6,030	3,650	1,914	6,127	2,296	90	3,621
Greece	3,620	294	2	478	641	861	369	226	17	731
Norway	9,389	683	—	1,950	745	2,207	1,262	1,073	—	1,470
Sweden	89,263	11,391	5,054	16,473	19,776	5,641	18,291	3,616	70	8,951
Switzerland	169,913	18,038	1,941	39,127	19,310	13,686	40,477	7,204	67	30,064
Austria	128,408	9,347	2,086	30,427	13,476	14,119	28,364	3,592	41	26,957
Portugal	4,745	115	11	1,521	461	391	1,371	171	—	705
Spain	30,241	1,310	436	10,359	4,666	901	4,786	2,667	1,932	3,183
Yugoslavia	69,598	910	3,432	20,391	9,370	10,713	15,110	456	1,247	7,969
U.S.S.R.	170,135	1,987	4,493	41,125	8,724	29,562	36,331	386	9	47,518
Poland	24,261	526	757	5,964	3,448	3,364	4,809	1,084	—	4,310
Czechoslovakia	32,501	1,269	1,294	14,069	376	4,429	6,483	1,205	905	2,474
Hungary	19,588	228	2,618	3,836	1,224	545	2,194	366	463	8,114
Romania	26	—	—	—	—	—	—	26	—	—
Bulgaria	65,080	7,452	763	9,024	3,356	17,442	24,484	113	958	1,488
AFRICA	23,866	2,366	241	6,421	101	4,889	4,140	2,347	401	2,960
South Africa	5,581	323	8	1,653	9	820	2,143	162	72	392
AMERICA	415,051	20,104	28,711	118,678	44,118	28,764	51,324	12,383	1,650	109,319
United States	313,951	13,104	22,836	87,702	34,508	14,742	39,305	5,421	105	96,229
Canada	41,035	4,463	1,671	13,006	2,995	7,551	2,809	2,480	250	5,808
Mexico	14,542	873	—	5,666	1,813	1,378	522	555	6	3,730
Venezuela	5,119	13	—	475	69	1,901	334	2,327	—	2
Brazil	29,454	983	3,226	9,741	3,404	2,883	5,899	56	159	3,102
Argentina	7,531	472	978	1,123	1,219	43	1,256	1,370	1,053	17
ASIA	312,625	12,530	9,582	117,938	24,696	52,090	59,968	11,049	1,674	23,099
Iran	51,146	2,333	224	7,792	5,543	14,637	12,845	3,200	470	4,103
Israel	6,921	142	48	2,912	2,212	47	535	616	22	386
Other Near East	9,045	653	3	1,310	128	786	4,384	1,043	466	273
India	57,114	1,518	3,285	15,183	5,130	14,253	14,623	608	65	2,451
Indonesia	6,127	443	22	720	899	3,076	399	68	398	101
Singapore	6,322	249	—	1,721	833	1,982	1,207	189	—	142
China	79,522	2,162	2,082	30,787	4,701	7,246	17,111	2,872	140	12,422
Japan	36,119	599	1,707	26,489	1,796	1,687	495	1,829	—	1,517
South Korea	32,593	1,705	1,503	22,010	619	3,589	2,766	125	53	224
Taiwan	14,760	653	667	6,265	1,351	3,941	1,717	69	—	96
AUSTRALIA & OCEANA	15,306	589	802	5,969	235	2,740	939	1,280	492	2,261
Australia	13,899	584	784	5,559	188	2,328	937	1,145	492	1,881

(a) Excludes parts.

Exchange Rate: $1 = 1.7974 Deutsche Mark.

Note: Indivdual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS
By Type of Machine & By Destination, 1987
(Thousands of U.S. Dollars)

Country of Destination	Total(a)	Hammers, Forging & Riveting, Blending & Forming	Mechanical Prssses	Hydraulic Presses	Sheet Metal-working Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$980,742	$108,072	$133,195	$98,842	$285,686	$199,067	$51,309	$104,573
EUROPE	598,901	69,099	58,762	52,831	199,216	121,371	33,377	64,246
France	72,921	6,693	9,416	2,617	29,064	11,909	3,969	9,253
Belgium-Luxembourg	33,261	6,132	3,901	1,153	9,379	11,446	206	1,045
Netherlands	42,104	1,458	6,074	6,959	16,624	7,202	535	3,252
Italy	67,102	11,236	2,537	4,420	23,832	13,257	4,873	6,948
United Kingdom	51,842	7,393	2,255	6,519	13,931	12,272	2,574	6,897
Ireland	2,701	140	398	72	937	911	166	76
Denmark	8,936	559	1,992	129	4,753	452	206	845
Greece	2,492	187	361	70	584	1,106	14	171
Norway	10,396	978	603	1,847	5,727	493	442	307
Sweden	25,816	958	1,062	2,930	15,304	3,115	320	2,126
Switzerland	49,449	6,768	3,865	5,719	21,391	6,658	1,536	3,512
Austria	41,874	2,713	7,909	3,257	14,140	7,833	166	5,856
Portugal	3,984	61	422	159	825	2,055	22	440
Spain	23,590	1,290	4,302	80	4,242	7,933	1,270	4,473
Yugoslavia	29,399	8,093	751	2,209	7,943	5,712	1,505	3,186
U.S.S.R.	53,677	4,898	2,326	3,999	14,069	9,507	11,130	7,748
Poland	14,548	1,834	277	1,339	1,359	4,727	3,755	1,257
Czechoslovakia	19,048	1,785	2,145	1,387	5,487	4,253	—	3,991
Hungary	6,284	117	1,341	793	1,687	1,010	510	825
Romania	578	578	—	—	—	—	—	—
Bulgaria	14,843	1,141	4,404	6,171	1,793	669	99	567
AFRICA	25,830	1,137	3,309	3,051	5,405	9,824	525	2,579
South Africa	5,419	56	2,081	67	899	2,056	73	187
AMERICA	138,644	5,222	37,980	17,281	27,573	27,413	7,092	16,083
United States	64,235	4,094	7,389	2,092	22,576	17,676	4,103	6,305
Canada	48,172	655	28,892	8,971	1,867	1,806	368	5,613
Mexico	7,475	—	736	4,806	318	584	22	1,009
Venezuela	1,383	9	96	12	83	1,117	—	66
Brazil	11,269	255	423	1,109	1,858	3,388	1,864	2,372
Argentina	2,645	103	—	—	311	1,025	735	471
ASIA	203,335	31,757	28,750	23,647	51,760	36,694	9,356	21,371
Iran	36,354	6,646	10,800	7,151	8,652	2,449	547	110
Israel	6,321	2,007	1,218	23	949	1,515	13	597
Other Near East	8,300	442	525	182	4,988	1,430	7	725
India	15,212	453	4,939	2,357	4,518	811	160	1,975
Indonesia	3,360	676	889	4	1,129	369	6	288
Singapore	3,150	239	1,094	191	973	501	—	150
China	68,715	11,740	5,767	5,438	16,647	15,845	3,542	9,737
Japan	23,679	3,435	357	1,100	5,500	3,329	4,800	5,157
South Korea	18,849	3,520	1,718	5,156	3,523	4,637	—	294
Taiwan	9,476	1,764	438	1,565	1,219	2,523	—	1,967
AUSTRALIA & OCEANA	14,032	856	4,394	2,033	1,732	3,764	959	294
Australia	12,262	701	4,394	2,033	1,388	2,505	959	282

Exchange Rate: $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine & By Destination, 1987

(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$891,064	$119,337	$17,365	$211,526	$101,699	$116,093	$184,608	$21,409	$2,852	$116,175
EUROPE	646,676	61,879	3,713	186,996	58,462	77,378	154,884	19,528	2,511	81,326
France	31,655	916	928	3,225	10,750	2,357	10,537	1,380	21	1,539
Belgium-Luxembourg	11,534	192	757	225	185	4,717	4,985	244	—	229
Netherlands	17,124	3,044	39	8,699	783	2,101	1,491	677	59	231
Italy	93,083	9,114	34	26,590	7,541	13,637	23,027	9,235	197	3,708
United Kingdom	39,776	2,644	165	8,370	3,876	6,174	9,207	300	1,469	7,572
Denmark	3,379	150	45	2,239	97	195	509	89	3	52
Spain	29,491	2,358	—	1,119	3,664	3,299	17,445	781	184	641
Sweden	31,825	1,759	11	22,692	2,311	3,459	1,109	93	2	389
Switzerland	302,096	36,968	1,439	96,090	19,371	13,848	66,991	3,549	505	63,334
Austria	50,236	2,341	171	12,517	8,486	17,174	4,067	2,501	45	2,934
Yugoslavia	4,419	282	100	1,008	119	669	2,173	57	—	12
U.S.S.R.	5,310	88	—	1,503	278	1,371	2,001	—	16	52
Poland	4,875	129	—	414	12	1,822	2,452	47	—	—
Czechoslovakia	9,725	376	8	889	762	1,829	5,859	—	—	3
Hungary	4,190	531	—	325	115	1,702	1,518	—	—	—
Romania	1,740	199	—	369	—	387	786	—	—	—
Other Europe	6,217	788	16	722	114	2,634	726	575	12	630
United States	36,993	4,002	13,534	12,781	3,853	1,257	878	136	12	539
Japan	162,597	40,230	—	5,541	36,495	22,337	23,357	1,164	305	33,167
China	9,177	598	—	587	1,364	4,502	2,097	—	—	28
South Korea	3,304	377	—	16	—	2,910	—	2	—	—
Taiwan	24,582	11,482	—	4,487	965	3,272	3,101	406	24	845
All Other Countries	7,736	769	118	1,118	560	4,437	290	172	—	270

(a) Excludes parts.

Exchange Rate: $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1987

(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$283,374	$19,110	$26,563	$35,791	$92,597	$59,597	$15,270	$34,447
EUROPE	244,794	15,698	25,641	34,479	76,153	50,496	8,883	33,444
France	17,812	898	613	4,019	4,443	4,200	417	3,223
Belgium-Luxembourg	16,122	456	1,308	3,590	8,528	467	1,247	526
Netherlands	14,914	850	1,248	2,606	8,167	867	56	1,119
Italy	55,659	3,891	8,717	11,342	14,868	5,135	2,403	9,303
United Kingdom	8,448	734	1,280	272	2,309	1,182	831	1,841
Denmark	5,570	717	88	787	3,463	366	—	150
Spain	10,316	48	3,804	610	584	4,865	273	133
Sweden	5,848	624	918	912	976	1,054	32	1,332
Switzerland	85,240	5,682	4,151	8,701	28,167	21,802	3,525	13,212
Austria	15,092	821	132	1,189	3,269	7,439	63	2,179
Yugoslavia	1,451	9	1,322	—	—	120	—	—
U.S.S.R.	634	—	467	22	146	—	—	—
Poland	13	—	—	—	6	7	—	1
Czechoslovakia	1,952	461	1,268	—	129	35	—	58
Hungary	1,151	2	95	—	475	495	—	84
Romania	—	—	—	—	—	—	—	—
Other Europe	4,570	505	231	428	624	2,462	37	283
United States	15,805	462	724	1,033	3,967	5,790	3,450	378
Japan	20,098	2,827	179	213	11,153	2,387	2,803	535
China	54	—	—	—	21	33	—	—
South Korea	16	—	—	—	2	14	—	—
Taiwan	159	—	3	—	24	4	108	18
All Other Countries	2,448	122	16	66	1,276	872	26	71

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.

Exchange Rate: $1 = 1.7974 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Sources: VDMA, "Fachgemeinschaft Werkzeugmaschinen und Fertigungssysteme"; VDW, "Verein Deutscher Werkzeugmaschinenfabriken e.V."

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1968 to Date

(Millions of U.S. Dollars)

Year	Production(r)	Imports	Exports	Domestic Consumption(r)
1968	$ 488.9	$ 94.9	$ 51.6	$ 532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	755.4	113.6	80.1	788.9
1972	679.4	74.1	90.8	662.7
1973	1,120.1	78.3	129.3	1,069.1
1974	1,230.2	127.6	197.8	1,160.0
1975	777.4	72.7	207.6	642.5
1976	770.9	46.8	256.5	561.2
1977	1,165.1	58.5	430.1	793.5
1978	1,736.7	93.3	770.4	1,059.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,008.2	168.6	1,188.9	1,987.9
1981	3,860.3	175.1	1,409.2	2,626.2
1982	3,143.0	175.0	994.1	2,323.9
1983	2,956.7	136.9	999.7	2,093.9
1984	3,711.2	123.2	1,319.9	2,514.5
1985	4,406.5	147.5	1,656.1	2,897.9
1986	5,337.1	197.3	2,157.6	3,376.8
1987	4,762.0	152.6	2,049.0	2,865.6

r - Revised.

Exchange rate: 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen; 1985 $ 1 = 238.54 Yen; 1986 $1 = 168.52 Yen; 1987 $1 = 144.64 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1969 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1969	23,033	$ 195.8	$ 18.3	$ 39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,854	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	936.8	276.3	40.4
1982	20,443	653.3	269.3	45.3
1983	21,895	588.2	254.3	34.1
1984	31,719	761.7	419.3	58.4
1985	28,110	910.2	522.9	71.5
1986	22,892	1,535.5	905.8	75.0
1987	22,103	1,664.0	985.8	111.7

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Number of Employees, 1965 to Date

Year	Employees	Year	Employees
1965	37,377	1977	32,168
1966	33,719	1978	28,154
1967	35,141	1979	31,113
1968	40,092	1980	33,737
1969	44,806	1981	33,420
1970	49,161	1982	34,204
1971	50,630	1983	33,705
1972	46,738	1984	33,628
1973	45,242	1985	34,644
1974	45,295	1986	35,306
1975	40,925	1987	32,705
1976	34,509		

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1986 and 1987

(Values in Thousands of U.S. Dollars)

Type of Machine	1986			1987		
	Production	Exports	Imports	Production	Exports	Imports
Total						
Units	22,892	27,790	2,992	22,103	33,848	5,135
Value	$1,535,450	$905,803	$75,047	$1,663,952	$985,772	$111,726
Hydraulic Presses						
Units	6,619	2,133	94	5,685	1,633	102
Value	$ 210,201	$ 87,307	$ 2,528	$ 187,452	$ 78,077	$ 6,105
Mechanical Presses						
Units	9,566	2,641	350	9,710	5,040	393
Value	$1,088,992	$492,345	$17,137	$1,166,323	$577,994	$ 21,453
Forging & Stamping Machines						
Units	612	275	30	608	274	89
Value	$ 48,855 (a)	$ 29,290	$ 7,257	$ 56,271(a)	$ 34,472	$ 28,775
Shearing Machines						
Units	4,339	7,611	256	4,344	8,556	303
Value	$ 99,282	$125,825	$ 5,109	$ 105,524	$110,564	$ 9,859
Bending Machines						
Units	985	2,046	366	866	2,030	335
Value	$ 42,280	$ 61,221	$10,349	$ 84,403	$ 65,687	$ 16,095
Wire Forming Machines						
Units	771	130	3	890	209	5
Value	$ 45,840	$ 7,542	$ 979	$ 63,980	$ 9,237	$ 671
Other Metal Forming Machines						
Units	—	12,954	1,893	—	16,106	3,908
Value	—	$102,279	$31,682	—	$109,741	$ 28,768

Exchange rate: 1986 $1 = 168.52 Yen; 1987 $1 = 144.64 Yen.

(a) Does not include Stamping.

Note: Individual items may not add to totals due to rounding.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine '87

(Values in Thousands of U ars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	125,536	$4,762,023	373,969	$2,049,046	42,429	$152,606
Horizontal Boring Machines	97	20,333	120	11,421	14	1,286
Jig Boring Machines	374	16,157	—	—	—	—
Boring Machines, NC	168	53,733	129	42,395	3	1,113
Boring Machines, N.E.C.	232	5,545	229	14,394	21	650
Radial Drilling Machines	225	5,220	66	1,756	—	—
Multi-Spindle Drilling Machines	359	11,587	251	14,201	—	—
Bench Drilling Machines	19,125	10,938	4,736	3,139	—	—
Drilling Machines, NC	1,597	63,219	1,117	60,032	136	2,759
Drilling Machines, N.E.C.	1,900	10,295	1,550	14,809	14,617	3,650
Gear Hobbing Machines	349	38,399	219	18,135	119	16,496
Gear Cutting Machines, N.E.C.	278	31,589	105	9,313		
Gear Finishing Machines	119	18,480	112	16,551		
Cylindrical Grinding Machines	1,089	89,069	232	19,573	60	7,239
Internal Grinding Machines	419	38,061	92	7,695	23	1,728
Surface Grinding Machines	3,487	127,295	962	23,272	946	12,659
Centerless Grinding Machines	606	52,530	183	18,909	—	—
Tool Grinding Machines (Universal)	973	31,976	141	2,323	—	—
Grinding Machines, NC	939	131,630	464	69,462	113	29,522
Grinding Machines, N.E.C.	778	72,532	13,562	93,086	19,567	20,119
Center Lathes	2,224	52,842	597	7,073	1,094	6,340
Automatic Lathes	2,515	82,266	1,339	22,511	87	2,606
Vertical Lathes, NC	618	76,113	7,047	587,051	49	6,492
Horizontal Lathes, NC	14,623	1,003,194				
Lathes, N.E.C.	1,086	16,462	1,166	10,682	189	1,618
Knee Type Milling Machines	1,813	43,308	368	9,009	142	1,203
Bed Type Milling Machines	596	22,622	—	—	—	—
Copy Milling Machines	425	11,809	262	3,035	774	802
Milling Machines, NC	1,811	172,497	474	90,639	49	10,122
Milling Machines, N.E.C.	214	7,875	1,998	21,315	360	2,517
Machining Centers, Vertical	5,869	547,781	4,173	570,893	—	—
Machining Centers, Horizontal	2,345	462,237			—	—
Machining Centers, N.E.C.	813	150,339			—	—
Electrical Discharge Machines, NC	4,744	433,691	—	—	137	8,179
Electrical Discharge Machines, N.E.C.	320	19,462	—	—	—	—
Special Purpose Machines, NC	1,140	198,818	—	—	—	—
Special Purpose Machines, N.E.C.	2,336	371,723	—	—	—	—
Other Metal Cutting Machines, NC	793	71,426	—	—	52	6,050
All Other Metal Cutting Machines, N.E.C.	48,137	188,959	332,275	286,387	3,877	9,465

Exchange rate: $1 = 144.64 Yen.

Note: Individual items may not add to totals due to rounding.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, For Selected Destinations, 1987

(Values in Thousands of U.S. Dollars)

	Destination									
Type of Machine	U.S.A.	Korea	West Germany	Belgium	Taiwan	United Kingdom	People's Rep. of China	Singapore	Canada	Indonesia
GRAND TOTAL										
UNITS	231,996	3,929	5,526	2,675	12,403	8,355	13,452	7,651	16,370	1,236
VALUE	$673,576	$268,439	$192,989	$120,541	$99,640	$70,672	$62,611	$42,464	$40,196	$39,657
Boring Machines										
Units	56	133	3	—	37	6	11	16	4	42
Value	$ 12,058	$ 27,316	$ 629	—	$ 2,600	$ 954	$ 1,901	$ 1,168	$ 574	$ 2,240
Drilling Machines										
Units	1,643	840	895	65	547	272	54	848	60	108
Value	$ 20,084	$ 29,210	$ 11,643	$ 270	$ 5,987	$ 1,466	$ 2,226	$ 3,277	$ 512	$ 3,042
Gear Cutting & Finishing										
Units	23	176	—	—	103	—	20	12	—	3
Value	$ 3,056	28,388	—	—	$ 4,452	—	$ 3,215	$ 138	—	$ 705
Grinding Machines										
Units	6,549	798	628	530	618	975	394	826	545	180
Value	$ 41,455	$ 65,120	$ 5,607	$ 277	$18,301	$ 6,001	$22,470	$12,452	$ 4,273	$ 4,826
Lathes										
Units	3,288	566	1,029	556	463	463	98	378	140	71
Value	$243,501	$ 38,668	$ 60,899	$ 61,836	$15,224	$28,540	$ 7,584	$ 9,251	$ 9,665	$15,380
Milling Machines										
Units	1,692	181	70	2	240	16	63	93	18	38
Value	$ 22,228	$ 30,158	$ 2,385	$ 90	$12,064	$ 1,224	$ 9,071	$ 3,056	$10,654	$ 2,053
Planing Machines										
Units	1	8	—	—	1	—	—	—	—	—
Value	$ 7	$ 650	—	—	$ 180	—	—	—	—	—
Machining Centers										
Units	2,064	44	472	284	140	163	18	50	85	34
Value	$239,989	$ 10,136	$ 63,655	$ 56,706	$18,612	$27,157	$ 6,160	$ 6,347	$10,827	$ 9,735
Other Metal Cutting Machines										
Units	216,680	1,183	2,429	1,238	10,254	6,460	12,794	5,428	15,518	760
Value	$ 91,213	$ 38,793	$ 48,168	$ 1,362	$22,207	$ 5,337	$ 9,970	$ 6,775	$ 3,699	$ 1,673

Exchange Rate: $1 = 144.64 Yen.

Note: Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1981 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1981	1982	1983	1984	1985	1986	1987
GRAND TOTAL							
Units	25,926	24,138	26,408	38,036	44,969	38,776	35,460
Value	$1,968,285	$1,693,551	$1,796,127	$2,483,723	$2,950,449	$3,622,994	$3,364,664
Boring Machines							
Units	136	139	140	215	168	208	168
Value	$ 57,471	$ 45,304	$ 42,236	$ 43,499	$ 38,430	$ 65,512	$ 53,733
Drilling Machines							
Units	300	201	501	631	633	1,339	1,597
Value	$ 9,722	$ 7,380	$ 17,817	$ 20,470	$ 19,116	$ 42,155	$ 63,219
Milling Machines							
Units	2,381	2,331	2,468	2,775	2,664	1,977	1,811
Value	$ 139,178	$ 135,968	$ 141,887	$ 146,779	$ 160,841	$ 166,603	$ 172,497
Grinding Machines							
Units	235	294	343	671	1,051	1,059	939
Value	$ 19,653	$ 23,867	$ 24,646	$ 49,301	$ 78,138	$ 131,474	$ 131,630
Lathes							
Units	12,133	10,344	10,020	16,555	19,084	15,976	15,241
Value	$ 731,361	$ 562,963	$ 511,494	$ 812,045	$ 926,377	$1,080,370	$1,079,307
Special Machines							
Units	103	137	497	1,193	1,531	1,441	1,140
Value	$ 53,149	$ 39,795	$ 62,799	$ 129,383	$ 190,350	$ 235,758	$ 198,818
Elec. Discharge Machines							
Units	3,020	3,534	4,233	5,034	5,830	5,240	4,744
Value	$ 180,846	$ 197,671	$ 256,585	$ 314,858	$ 375,811	$ 492,488	$ 433,691
Machining Centers							
Units	7,394	6,942	7,791	10,252	13,345	10,857	9,027
Value	$ 749,821	$ 649,853	$ 701,368	$ 897,002	$1,120,609	$1,353,394	$1,160,343
Other NC Metal Cutting Machines							
Units	224	216	415	710	663	679	793
Value	$ 27,085	$ 30,749	$ 37,294	$ 70,386	$ 40,781	$ 55,240	$ 71,426

Exchange rate: 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52; 1984 $1 = 237.52 Yen; 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen; 1987 $1 = 144.64 Yen.

Note: Individual items may not add to totals due to rounding.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1987

(Values in Thousands of U.S. Dollars)

	Exports to U.S.		Imports from U.S.	
Type of Machine	Units	Value	Units	Value
Boring Machines	33	$ 10,115	—	—
Drilling Machines	402	16,745	—	—
Grinding Machines	88	12,777	36	$8,338
Lathes	3,177	241,088	10	3,602
Milling	106	18,847	6	5,365
Machines Centers	2,064	239,989	—	—
Other	—	—	9	484

Exchange rate: $1 = 144.64 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, 1985 to Date

(Values in Thousands of U.S. Dollars)

Destination	1985		1986		1987	
	Units	Value	Units	Value	Units	Value
TOTAL CUTTING	342,371	$1,656,074	433,243	$2,157,643	373,969	$2,049,046
North & South America						
Brazil	103	$ 2,029	148	$ 6,747	260	$ 13,834
Canada	4,129	35,340	47,640	33,848	16,370	40,196
Mexico	358	5,928	185	5,875	86	4,432
U.S.A.	142,446	708,816	269,692	859,299	231,996	673,576
Western Europe						
Belgium	2,636	61,059	2,627	110,159	2,675	120,541
France	2,828	23,694	5,244	29,859	5,038	28,567
Netherlands	1,799	12,786	1,867	16,354	3,162	12,217
Norway	930	5,265	903	7,940	1,136	3,823
Sweden	1,439	25,941	1,198	35,474	1,246	33,614
United Kingdom	6,360	62,283	7,464	78,554	8,355	70,672
West Germany	5,075	118,810	4,896	184,257	5,526	192,989
Eastern Europe						
Poland	5	1,010	15	3,103	3	1,265
Romania	2	126	—	—	—	—
U.S.S.R.	468	70,793	303	39,568	190	29,867
Asia						
Burma	163	797	85	1,252	69	1,072
China	16,367	72,151	2,285	157,803	13,452	62,611
Korea	2,292	117,683	3,082	178,483	3,929	268,439
Philippines	237	1,035	1,833	3,525	770	4,114
Singapore	4,248	20,978	4,999	22,769	7,651	42,464
Taiwan	8,432	34,527	8,635	45,911	12,403	99,640
Thailand	5,177	19,536	2,023	11,079	3,668	30,372
All Other Countries						
Australia	36,885	56,284	21,048	63,541	20,903	33,829
South Africa	2,405	6,636	1,660	4,818	2,420	8,082
All Other Countries	97,587	192,567	45,411	257,425	32,661	272,829
TOTAL FORMING	29,773	$ 522,902	27,790	$ 905,809	30,853(a)	$ 906,928(a)
North America						
Canada	136	$ 5,236	265	$ 82,809	270	$ 27,026
Mexico	113	16,563	78	6,272	166	4,107
U.S.A.	6,583	131,525	10,345	451,371	8,500	397,566
Western Europe						
France	48	1,861	129	6,539	157	7,785
Italy	50	1,488	147	2,949	76	7,239
Switzerland	181	880	226	1,056	35	1,500
United Kingdom	1,014	6,837	711	10,230	872	40,950
West Germany	1,550	18,144	1,033	26,305	979	18,100
Eastern Europe						
U.S.S.R.	111	55,479	27	20,472	31	56,679
Asia						
China	2,042	73,338	1,547	103,970	748	71,771
Indonesia	2,078	5,697	1,150	6,812	496	9,271
Korea	1,329	69,640	1,166	53,893	1,345	72,248
Malaysia	739	20,999	234	6,569	436	14,090
Singapore	904	9,810	722	14,040	887	26,894
Taiwan	1,144	18,684	1,479	27,510	2,132	47,075
All Other Countries	11,751	86,719	8,531	84,969	13,723	104,625

Exchange rate: 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen; 1987 $1 = 144.64 Yen.

(a) 1987 Metal Forming data consists of data for January 1987 through November 1987.

Note: Individual items may not add to totals due to rounding.

Sources: Japan, Ministry of Finance and Ministry of International Trade and Industry.

JAPANESE IMPORTS OF MACHINE TOOLS
Metal Cutting and Metal Forming, 1985 to Date
(Values in Thousands of U.S. Dollars)

	1985		1986		1987	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL CUTTING	15,019	$147,506	15,851	$197,253	42,429	$152,606
United States	1,221	$ 21,674	1,240	$ 31,622	1,022	$ 29,266
Western Europe						
Austria	172	277	197	356	145	3,996
France	494	683	361	1,430	480	698
Italy	181	3,664	377	3,566	383	3,187
Sweden	84	1,899	79	807	39	111
Switzerland	1,144	51,245	665	51,667	437	36,338
United Kingdom	335	2,960	344	3,810	2,373	2,890
West Germany	940	31,148	902	68,633	737	42,727
Eastern Europe						
Czechoslovakia	7	398	10	356	12	767
East Germany	32	4,083	30	3,643	42	2,904
Poland	—	—	2	47	3	422
U.S.S.R.	145	4,607	263	4,890	220	4,432
Asia						
Singapore	940	8,732	620	6,189	793	7,494
Taiwan	8,434	6,875	9,664	8,996	34,553	10,315
Other Countries	890	9,261	1,097	11,239	1,190	7,059
TOTAL FORMING	2,628	$ 71,451	2,992	$ 75,047	4,929(a)	$106,492(a)
United States	1,353	$ 20,546	1,525	$ 24,958	1,036	$ 30,669
Western Europe						
Switzerland	224	17,477	251	11,732	226	10,633
West Germany	191	22,961	185	24,780	211	31,824
Other Countries	860	10,468	1,031	13,577	3,456	33,366

Exchange rate: 1985 $1 = 238.54 Yen; 1986 $1 = 168.52 Yen; 1987 $1 = 144.64 Yen.

(a) 1987 Metal Forming data consists of data for January 1987 through November 1987.

Note: Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1987
(Values in Thousands of U.S. Dollars)

Type of Machine	Country of Origin									
	West Germany	Switzerland	U.S.A.	Taiwan	Singapore	U.S.S.R	Austria	Korea	Italy	East Germany
GRAND TOTAL										
UNITS	737	437	1,022	34,553	793	220	145	456	383	42
VALUE	$42,727	$36,338	$29,266	$10,315	$7,494	$4,432	$3,996	$3,436	$3,187	$2,904
Boring Machines										
Units	—	3	—	5	—	5	—	1	11	9
Value	—	$ 1,072	—	$ 62	—	$ 574	—	$ 55	$ 131	$1,106
Drilling Machines										
Units	20	5	146	14,258	—	42	—	32	3	6
Value	$ 664	$ 857	$ 152	$1,376	—	$ 373	—	$1,528	$1,051	$ 62
Gear Cutting and Finishing										
Units	13	55	28	1	—	5	—	2	—	1
Value	$ 2,786	$ 7,412	$ 4,127	$ 28	—	$ 228	—	$ 7	—	$ 325
Grinding Machines										
Units	261	113	568	18,220	730	34	2	52	130	11
Value	$28,554	$15,259	$13,302	$ 2,012	$7,156	$ 318	$ 7	$ 138	$1,023	$1,037
Lathes										
Units	71	26	17	723	—	72	101	111	7	14
Value	$ 2,772	$ 1,265	$ 3,692	$4,010	—	$1,106	$ 221	$1,196	$ 270	$ 277
Milling Machines										
Units	27	11	13	514	61	56	38	46	116	1
Value	$ 761	$ 615	$ 5,524	$ 1,162	$ 325	$1,341	$3,754	$ 353	$ 304	$ 97
Planing Machines										
Units	—	—	—	—	—	3	—	—	—	—
Value	—	—	—	—	—	$ 263	—	—	—	—
Other Metal Cutting Machines										
Units	345	224	250	832	2	3	4	212	116	—
Value	$ 7,190	$ 9,859	$ 2,475	$1,666	$ 14	$ 228	$ 14	$ 159	$ 415	—

Exchange rate: $1 = 144.64 Yen.

Note: Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS

1965 to Date

(Millions of Dollars)

Year	Net New Orders			Shipments			Unfilled Orders
	Total	Domestic	Foreign	Total	Domestic	Foreign	
1965	$ 442.0	$322.0	$120.0	$ 395.9	$272.9	$123.0	$292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979	1,260.3	771.6	488.7	1,205.9	793.6	412.3	742.7
1980	1,038.8	562.3	476.5	1,370.6	813.9	556.7	418.7
1981	865.3	273.2	592.1	903.2	498.5	404.7	304.2
1982	576.8	327.0	249.8	763.6	414.0	349.6	157.5
1983	471.7	259.7	212.0	544.0	318.5	225.5	NA
1984	535.5	284.3	251.2	519.6	303.3	216.3	NA
1985	618.3	321.8	296.5	580.4	316.9	263.5	NA
1986(r)	730.6	341.8	388.8	735.4	409.6	325.8	NA
1987(p)	836.3	436.1	400.2	833.5	454.1	379.4	NA

NA - Not Available. p - Preliminary. r - Revised.

Note: Net new orders and shipments beginning in 1986 are estimated from a larger sampling of firms and, consequently, are reflected in higher figures.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

Number of Employees, 1968 to Date

Mid-Year	Employees	Mid-Year	Employees
1968	63,600	1978	48,500
1969	63,700	1979	48,350
1970	65,100	1980	46,350
1971	59,000	1981 (r)	36,700
1972	50,100	1982 (r)	29,825
1973	48,400	1983 (r)	25,925
1974	50,000	1984 (r)	23,775
1975	49,100	1985 (r)	23,800
1976	47,050	1986 (r)	23,400
1977	47,675	1987 (p)	23,200

p - Preliminary. r - Revised.

Note: Data from 1982 forward relates to Great Britain only.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, Units and Value, 1986 and 1987

(Values in Thousands of U.S. Dollars)

Type of Machine	1986 (r)		1987	
	Units	Value	Units	Value
TOTAL (excluding parts)	NA	$254,084	2,728E	295,494
Drilling Machines Boring Machines Milling Machines	NA	14,963	82	28,845
Machining Centers - Horizontal	158	33,301	129	45,889
Machining Centers - Vertical	912	68,802	755	73,587
Machining Centers (manual tool change) and Indexing Turret	1,043	36,822	830	43,923
Lathes	895	51,198	619E	33,434
Other Numerically Controlled Machines	391	48,998	313	69,816

r - Revised. E - Estimate.

Exchange Rate: 1986 1 Pound = $1.467; 1987 1 pound = $1.6389.

Note: Individual items may not add to totals due to rounding.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

1970 to Date

(Values in Thousands of Dollars)

Year	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
	Units	Value	Units	Value	Units	Value	Units	Value
1970(a)	725	$ 52,561	350	$ 26,978	600	$ 37,773	241	$ 15,848
1971	343	26,320	156	12,842	590	44,591	280	23,023
1972	548	42,199	189	14,551	381	27,173	150	12,735
1973	634	44,562	238	18,884	462	30,379	178	13,255
1974	739	65,520	353	32,362	709	37,452	246	15,171
1975	283	28,833	70	8,610	739	52,719	271	20,898
1976	535	57,429	157	17,820	612	48,635	192	17,598
1977	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978	681	105,966	209	26,135	969	102,376	245	29,086
1979	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980	978	160,736	397	60,193	1,240	198,985	421	54,712
1981	1,237	192,812	398	75,702	1,196	165,037	399	56,167
1982	1,370	124,583	NA	35,280	1,510	173,718	424	74,738
1983	2,010	125,721	NA	42,646	1,825	130,767	489	43,804
1984	NA	152,698	NA	64,093	NA	157,594	815	51,033
1985	NA	219,075	NA	100,982	NA	184,723	NA	79,074
1986(r)	NA	308,510	NA	170,319	NA	254,084	NA	122,641
1987(p)	NA	319,422	NA	143,076	2,728E	295,494	NA	124,884

NA - Not Available. p - Preliminary. r - Revised. E - Estimate.

(a) Includes parts.

(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trades Association, and United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1986 and 1987

(Values in Thousands of U.S. Dollars)

Type of Machine	1986(r) Units	1986(r) Value	1987 Units	1987 Value
TOTAL	NA	$336,090	NA	$366,622
Boring Machines				
Fine	91	7,042	93	3,442
Horizontal				
Jig, Vertical and Other	—	—	—	—
Drilling Machines				
Vertical	638	3,814	716	4,097
Radial and Other				
Gear Cutting and Finishing Machines)	(b)	(b)	(b)	(b)
Grinding and Polishing Machines				
Cylindrical—External	272	20,245	208	16,061
Cylindrical—Universal				
Cylindrical—Internal	8	587	—	—
Surface	NA	10,856	513	11,800
Tool and Cutter	308	4,254	NA	3,114
Other Grinding	(d)	(d)	(d)	(d)
Honing and Lapping	1,390	15,404	1,007	14,586
Lathes				
Automatic (excl. plugboard)	6,569	52,665	NA	59,656
Other Lathes	119	6,895		
Milling Machines				
Knee and Column	1,316	16,577	1,516	21,797
Bed Type	26	1,174		
Other	105	1,027		
Other Metal Cutting				
Transfer, Single Station and Unit Head Machines	NA	33,154	NA	60,148
Sawing and Cut-Off	5,558	13,056	6,208	6,883
Screwing and Threading	172	13,496	10	11,637
Other Metal Cutting, N.E.C.				
Parts for Metal Cutting Machine Tools	—	135,844	—	153,401 (c)

NA - Not Available. r - Revised.

(a) Excludes numerically controlled machines.
(b) Included in "Other Metal Cutting, N.E.C."
(c) Includes electrical discharge machines.
(d) Included in "Honing and Lapping."

Exchange Rate: 1986 1 Pound = $1.467; 1987 1 Pound = $1.6389.

Note: Individual items may not add to totals due to rounding.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)
By Type of Machine, Units and Value, 1986 and 1987
(Values in Thousands of U.S. Dollars)

Type of Machine	1986		1987	
	Units	Value	Units	Value
TOTAL	—	$133,644	—	$127,670
Presses				
Hydraulic—Open Front	273	7,042	NA	7,047
Hydraulic— Straight, Extrusion & Other	(b)	(b)	(b)	(b)
Mechanical— Open Front	155	4,254	(b)	(b)
Mechanical—Straight Sided	(b)	(b)	(b)	(b)
Other Mechanical	(b)	(b)	(b)	(b)
Forging Machines	826	4,841	NA	3,278
Shearing Machines	(b)	(b)	(b)	(b)
Plate & Sheet Bending & Forming	(b)	(b)	(b)	(b)
Bar, Tube & Section Drawing & Forming	458	13,643	292	17,536
Wire and Strip Drawing & Forming	144	3,521	255	11,964
Sheet Metal	(b)	(b)	64	2,786
Other Bending & Working	(b)	(b)	(b)	(b)
Riveting and Other Metal Forming	958	62,348	NA	50,314
Parts for Metal Forming Machine Tools	—	37,995	—	34,745

Exchange Rate: 1986 1 Pound = $1.467; 1987 1 Pound = $1.6389.

(a) Excludes numerically controlled machines.
(b) Included in "Riveting and Other Metal Forming."

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS
New and Used, For Selected Countries, 1987
(Values in U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$182,222,681	U.S.A.	$97,320,619	South Africa	$8,408,519
Japan	115,074,180	West Germany	52,694,291	South Korea	6,833,058
U.S.A.	43,623,609	France	34,453,978	Finland	6,176,121
Switzerland	36,842,480	Spain	29,372,092	Iran	5,424,526
Italy	25,687,617	Italy	24,660,818	Egypt	5,317,642
Taiwan	21,395,817	Canada	23,747,654	Norway	5,076,912
Sweden	16,588,944	Belgium	21,066,876	Iraq	4,719,339
Belgium	13,407,544	Sweden	18,364,961	Austria	4,198,981
France	13,295,394	Australia	14,988,771	Brazil	4,157,153
Spain	12,015,936	U.S.S.R.	14,796,674	Pakistan	3,894,076
Austria	10,669,590	Holland	13,391,065	Turkey	3,785,934
United Kingdom	10,043,291	Ireland	11,800,542	Japan	3,707,421
Holland	6,446,667	Switzerland	11,130,216	Portugal	3,529,971
East Germany	3,573,090	China	10,213,998	Denmark	2,998,386
Portugal	2,913,040	India	9,574,791	Israel	2,672,926

Exchange Rate: 1 Pound = $1.6389.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1987

By Type of Machine, Total and NC; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	France	Spain	Italy	Canada	Belgium
Grand Total (incl. NC)								
Units	26,725	5,329	2,056	1,228	529	1,176	1,369	554
Value	$500,961	$97,321	$52,694	$34,455	$29,372	$24,661	$23,748	$21,066
Boring (incl. NC)								
Units	583	43	35	6	158	29	27	15
Value	$ 43,382	$ 6,665	$ 3,889	$ 38	$15,330	$ 1,003	$ 2,017	$ 2,334
Boring, NC								
Units	139	24	12	—	59	—	4	10
Value	$ 31,280	$ 5,574	$ 2,368	—	$11,515	—	$ 1,644	$ 2,303
Drilling (incl. NC)								
Units	770	82	19	51	7	20	29	16
Value	$ 12,959	$ 1,488	$ 488	$ 647	$ 111	$ 280	$ 2,339	$ 175
Drilling, NC								
Units	47	7	4	3	2	—	4	1
Value	$ 7,855	$ 1,023	$ 365	$ 302	$ 87	—	$ 2,201	$ 70
Gear Cutting & Finishing (incl. NC)								
Units	95	6	21	3	—	14	6	5
Value	$ 4,328	$ 1,347	$ 733	$ 126	—	$ 479	$ 247	$ 341
Gear Cutting & Finishing, NC								
Units	7	4	1	—	—	—	1	—
Value	$ 1,754	$ 1,121	$ 31	—	—	—	$ 225	—
Grinding & Polishing(incl. NC)								
Units	4,202	833	247	356	58	148	198	69
Value	$ 76,048	$19,896	$ 5,241	$ 6,541	$ 3,188	$ 4,738	$ 2,253	$ 1,475
Grinding & Polishing, NC								
Units	118	13	9	8	2	19	7	2
Value	$ 18,546	$ 4,223	$ 1,075	$ 1,783	$ 1,296	$ 1,821	$ 170	$ 949
Lathes (incl. NC)								
Units	6,046	995	557	257	76	286	212	114
Value	$ 94,848	$17,925	$11,538	$ 7,650	$ 2,312	$ 6,056	$ 3,089	$ 5,074
Lathes, NC								
Units	338	49	39	43	12	25	7	48
Value	$ 31,695	$ 5,033	$ 3,935	$ 3,532	$ 1,231	$ 2,352	$ 762	$ 3,992
Milling (incl. NC)								
Units	1,446	341	62	32	22	112	119	13
Value	$ 37,747	$10,187	$ 1,280	$ 783	$ 1,200	$ 2,991	$ 903	$ 413
Milling, NC								
Units	521	174	11	13	10	36	5	8
Value	$ 24,708	$ 6,819	$ 541	$ 549	$ 636	$ 1,826	$ 144	$ 298
Other Metal Cutting								
Units	5,285	1,161	371	269	39	293	550	75
Value	$112,810	$20,590	$19,095	$14,608	$ 2,281	$ 5,166	$ 2,732	$ 6,284
Total Metal Forming								
Units	8,298	1,868	744	254	169	274	228	247
Value	$118,838	$19,223	$10,430	$ 4,061	$ 4,949	$ 3,948	$10,166	$ 4,971

Exchange Rate: 1 Pound = $1.6389.

Note: Individual items may not add to totals due to rounding.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1986
By Type of Machine, Total and N/C; Total & Major Countries of Destination
(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	China	France	Italy	India	Canada
Grand Total (incl. N/C)								
Units	21,751	4,233	2,389	152	1,134	872	375	965
Value	$377,548	$91,270	$43,555	$18,040	$26,890	$14,251	$12,814	$15,689
Boring (incl. N/C)								
Units	516	131	56	26	26	29	20	18
Value	$ 22,278	$ 3,494	$ 3,639	$ 1,629	$ 2,568	$ 314	$ 2,175	$ 1,162
Boring, N/C								
Units	59	10	14	2	8	1	5	2
Value	$ 12,900	$ 1,956	$ 2,852	$ 486	$ 2,294	$ 169	$ 1,700	$ 602
Drilling (incl, N/C)								
Units	970	52	69	3	101	12	20	5
Value	$ 6,423	$ 1,074	$ 420	$ 39	$ 184	$ 255	$ 174	$ 83
Drilling, N/C								
Units	22	5	3	—	—	—	1	1
Value	$ 1,973	$ 446	$ 244	—	—	—	$ 86	$ 59
Gear Cutting & Finishing (incl. N/C)								
Units	129	20	17	2	—	11	30	3
Value	$ 3,263	$ 831	$ 681	$ 401	—	$ 123	$ 94	$ 134
Gear Cutting & Finishing, NC								
Units	17	—	1	2	—	—	13	—
Value	$ 736	—	$ 118	$ 401	—	—	$ 44	—
Grinding & Polishing (incl. N/C)								
Units	3,328	708	317	28	201	124	98	104
Value	$ 55,841	$18,246	$ 5,208	$ 1,159	$ 3,813	$ 1,632	$ 1,668	$ 1,168
Grinding & Polishing, NC								
Units	49	13	9	1	1	1	1	—
Value	$ 12,978	$ 3,962	$ 1,941	$ 106	$ 453	$ 165	$ 222	—
Lathes (incl. N/C)								
Units	4,043	972	537	18	230	120	21	192
Value	$ 73,149	$21,495	$ 9,824	$ 1,090	$ 5,029	$ 3,229	$ 2,386	$ 1,994
Lathes, N/C								
Units	217	62	25	9	26	12	13	2
Value	$ 20,996	$ 5,215	$ 2,961	$ 758	$ 2,123	$ 1,233	$ 1,950	$ 128
Milling (incl. N/C)								
Units	1,111	244	70	11	64	136	27	70
Value	$ 38,462	$11,423	$ 2,885	$ 1,644	$ 1,648	$ 3,782	$ 1,299	$ 1,383
Milling, N/C								
Units	438	179	34	2	17	18	5	10
Value	$ 24,644	$ 9,015	$ 2,141	$ 64	$ 1,161	$ 1,296	$ 862	$ 914
Other Metal Cutting								
Units	3,190	905	332	21	189	101	85	302
Value	$ 74,955	$12,517	$12,045	$ 3,783	$ 8,667	$ 2,484	$ 2,830	$ 2,409
Total Metal Forming								
Units	8,464	1,201	991	43	323	339	74	271
Value	$103,177	$22,190	$ 8,853	$ 8,295	$ 4,981	$ 2,432	$ 2,188	$ 7,356

Exchange Rate: 1 Pound = $1.467.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1987

By Type of Machine, Total and NC; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	Japan	United States	China	Italy	Taiwan	Sweden
Grand Total (incl. NC)								
Units	38,431	11,334	4,708	5,183	1,850	3,666	1,075	1,067
Value	$516,942	$182,219	$115,074	$43,624	$36,767	$20,709	$14,768	$16,589
Boring (incl. NC)								
Units	281	122	14	34	21	17	—	3
Value	$ 18,939	$ 11,518	$ 1,414	$ 980	$ 1,896	$ 374	—	$ 477
Boring, NC								
Units	54	29	9	2	5	1	—	1
Value	$ 14,589	$ 9,678	$ 1,075	$ 474	$ 1,837	$ 236	—	$ 474
Drilling (incl, NC)								
Units	1,904	241	119	670	28	29	—	94
Value	$ 11,728	$ 5,485	$ 1,383	$ 859	$ 1,270	$ 311	—	$ 180
Drilling, NC								
Units	107	45	24	6	7	1	—	1
Value	$ 8,190	$ 4,035	$ 1,264	$ 577	$ 1,134	$ 44	—	$ 5
Gear Cutting & Finishing (incl. NC)								
Units	34	12	1	2	3	4	—	1
Value	$ 5,587	$ 2,873	$ 129	$ 392	$ 680	$ 175	—	$ 48
Gear Cutting & Finishing, NC								
Units	15	9	1	1	1	—	—	—
Value	$ 4,038	$ 2,416	$ 129	$ 270	$ 402	—	—	—
Grinding & Polishing (incl. NC)								
Units	6,732	2,586	917	745	102	331	10	252
Value	$ 62,747	$ 20,930	$ 7,845	$ 7,257	$ 8,930	$ 5,836	$ 84	$ 2,042
Grinding & Polishing, NC								
Units	122	27	47	17	19	2	—	3
Value	$ 24,075	$ 7,629	$ 6,249	$ 1,865	$ 4,533	$ 1,031	—	$ 1,175
Lathes (incl. NC)								
Units	3,191	551	685	170	117	63	588	78
Value	$118,696	$ 38,963	$ 39,099	$ 4,237	$ 5,474	$ 2,658	$ 6,393	$ 4,813
Lathes, NC								
Units	847	174	413	37	9	15	107	20
Value	$ 90,236	$ 31,967	$ 35,567	$ 3,053	$ 1,906	$ 1,431	$ 4,317	$ 3,997
Milling (incl. NC)								
Units	1,248	317	23	18	6	71	117	17
Value	$ 33,874	$ 11,425	$ 2,040	$ 551	$ 2,201	$ 1,573	$ 3,165	$ 239
Milling, NC								
Unit	278	83	16	5	2	14	117	—
Value	$ 22,038	$ 8,709	$ 1,754	$ 416	$ 1,139	$ 775	$ 3,165	—
Other Metal Cutting								
Units	8,833	1,630	2,274	368	194	2,213	272	105
Value	$143,007	$ 54,769	$ 41,307	$ 9,524	$ 8,952	$ 5,004	$ 5,023	$ 3,256
Total Metal Forming								
Units	16,208	5,875	675	3,176	1,379	938	88	517
Value	$122,365	$ 36,256	$ 21,855	$19,826	$ 7,364	$ 4,777	$ 103	$ 5,533

Exchange Rate: 1 Pound = $1.6389.

Note: Individual items may not add to totals due to rounding.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1986

By Type of Machine, Total and N/C; Total & Major Countries of Origin

(Values in Thousands of U.S. Dollars)

Type of Machine	Total World	West Germany	United States	Japan	Switzerland	Italy	Canada	Sweden
Grand Total (incl. N/C)								
Units	90,052	11,738	2,263	4,095	912	8,377	132	1,262
Value	$548,869	$162,278	$70,612	$106,191	$45,432	$33,400	$29,676	$18,484
Boring (incl. N/C)								
Units	560	120	41	51	43	89	—	3
Value	$ 32,992	$ 11,270	$ 2,169	$ 8,391	$ 3,532	$ 2,677	—	$ 38
Boring, N/C								
Units	116	41	10	33	9	14	—	—
Value	$ 24,029	$ 8,771	$ 1,384	$ 7,203	$ 2,945	$ 1,520	—	—
Drilling (incl. N/C)								
Units	14,998	379	158	55	20	134	11	158
Value	$ 15,098	$ 5,517	$ 2,253	$ 609	$ 521	$ 491	$ 23	$ 188
Drilling, N/C								
Units	18	14	39	1	—	—	—	—
Value	$ 2,417	$ 1,847	$ 2,253	$ 33	—	—	—	—
Gear Cutting & Finishing (incl. N/C)								
Units	66	12	39	2	2	4	—	—
Value	$ 6,952	$ 2,305	$ 2,503	$ 447	$ 229	$ 877	—	—
Gear Cutting & Finishing, N/C								
Units	8	6	—	2	—	—	—	—
Value	$ 2,175	$ 1,728	—	$ 447	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	43,661	4,026	779	1,226	122	2,356	39	328
Value	$ 78,312	$ 31,561	$11,679	$ 4,474	$13,107	$ 4,238	$ 30	$ 3,511
Grinding & Polishing, N/C								
Units	871	31	17	15	9	10	—	5
Value	$ 19,326	$ 7,378	$ 2,795	$ 2,425	$ 2,219	$ 1,990	—	$ 1,394
Lathes, N/C)								
Units	3,180	388	206	490	62	230	1	343
Value	$114,099	$ 28,137	$16,906	$ 36,534	$ 3,752	$ 5,295	$ 2	$ 7,729
Lathes, N/C								
Units	1,149	168	132	471	11	22	—	31
Value	$ 91,620	$ 21,083	$16,286	$ 35,758	$ 1,768	$ 2,238	—	$ 6,150
Milling (incl. N/C)								
Units	1,628	274	21	47	22	49	13	28
Value	$ 30,236	$ 12,579	$ 921	$ 2,381	$ 1,033	$ 1,701	$ 11	$ 505
Milling, N/C								
Units	213	74	18	34	3	12	—	2
Value	$ 17,860	$ 9,615	$ 910	$ 2,150	$ 382	$ 981	—	$ 279
Other Metal Cutting								
Units	12,142	2,039	286	1,408	117	3,619	22	82
Value	$169,370	$ 41,082	$26,515	$ 41,669	$ 8,857	$ 9,063	$29,191	$ 343
Total Metal Forming								
Units	13,817	4,500	733	816	524	1,896	46	320
Value	$101,810	$ 29,827	$ 7,666	$ 11,686	$14,401	$ 9,058	$ 419	$ 6,170

Exchange Rate: 1 Pound = $1.467.

Source: The Department of Trade and Industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Type of Machine, Units and Value, 1984 to Date
(Thousands of U.S. Dollars)

	1984		1985		1986	
Type of Machine	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	13,057	$ 56,133	7,970	$ 58,895	29,855	$105,817
Metal Cutting Total	10,163	36,631	6,112	37,265	23,521	61,281
Lathes	309	6,593	299	8,596	644	14,789
Boring Machines	404	992	53	1,634	87	1,033
Milling Machines	620	2,710	808	3,149	246	3,137
Planing Machines	2	2	1	14	—	—
Broaching Machines	11	152	3	66	6	36
Drilling Machines	776	970	370	1,013	2,483	2,745
Grinding & Polishing Machines	7,077	13,641	3,242	12,296	16,096	13,671
Gear Cutting Machines	17	2,848	59	438	24	1,536
Other Metal Cutting	947	8,723	1,277	10,059	3,935	24,334
Metal Forming Total	2,894	19,502	1,856	21,630	6,334	44,536
Presses	157	3,231	203	4,709	363	9,093
Forging & Stamping Machines	14	379	24	1,700	33	7,454
Bending & Rolling Machines	356	2,799	351	2,889	568	6,911
Other Metal Forming	2,367	12,643	1,278	12,332	5,370	21,078
TOTAL EXPORTS	85,481	$113,261	22,823	$151,452	31,276	$178,681
Metal Cutting Total	32,883	85,164	13,953	116,693	12,279	142,506
Lathes	2,351	16,103	1,946	25,049	1,600	24,967
Boring Machines	123	5,108	171	7,645	85	9,067
Milling Machines	19,051	39,688	5,626	48,993	5,270	65,728
Planing Machines	41	163	—	—	5	46
Broaching Machines	6	33	10	147	10	110
Drilling Machines	2,241	5,432	2,085	8,411	1,763	7,395
Grinding & Polishing Machines	6,589	8,449	1,471	12,395	841	14,201
Gear Cutting Machines	8	150	16	290	9	116
Other Metal Cutting	2,473	10,038	2,628	13,763	2,696	20,876
Metal Forming Total	42,598	28,097	8,870	34,759	18,997	36,175
Presses	1,317	9,887	991	10,374	840	13,487
Forging & Stamping Machines	30	537	52	876	29	953
Bending & Rolling Machines	257	4,312	3,746	4,302	781	5,096
Other Metal Forming	40,994	13,361	4,081	19,207	17,347	16,639

Exchange Rate: 1984 $1 = 160.76 Pesetas, 1985 $1 = 170.04 Pesetas; 1986 $1 = 140.05 Pesetas.

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination, 1984 to Date (a)
(Thousands of U.S. Dollars)

Country	Imports 1984	Imports 1985	Imports 1986	Exports 1984	Exports 1985	Exports 1986
GRAND TOTAL	$56,133	$58,895	$105,817	$113,261	$151,452	$178,681
Australia	—	—	1	3,009	0,133	2,809
Belgium-Luxemburg	537	912	1,283	1,814	2,607	3,979
Canada	60	20	85	3,113	4,110	3,911
Colombia	—	—	—	1,905	2,049	3,702
Cuba	—	—	—	1,855	7,205	4,179
Denmark	224	411	794	1,084	1,579	2,910
Egypt	—	—	—	1,624	1,672	1,964
Finland	74	77	75	1,463	1,931	3,610
France	4,556	5,635	6,073	8,197	9,115	17,273
Hong Kong	2	1	4	1,323	2,344	2,937
India	—	—	—	2,817	2,494	1,551
Italy	8,796	9,098	19,148	2,397	3,631	6,536
Japan	3,207	5,851	15,667	7	57	54
Mexico	—	6	—	4,126	9,762	4,078
Morocco	—	—	8	713	2,334	1,640
Netherlands	1,119	139	439	2,521	4,703	7,490
Portugal	168	210	467	3,238	4,540	7,301
South Africa	—	—	1	3,096	5,294	1,288
Sweden	2,186	2,052	667	3,118	4,248	5,570
Switzerland	6,036	4,497	8,905	1,566	1,858	3,069
United Kingdom	3,712	4,752	6,775	6,626	10,051	12,618
U.S.A.	4,007	4,165	5,051	15,981	19,105	20,774
Venezuela	—	—	—	3,919	4,442	3,410
West Germany	19,023	17,529	34,134	15,706	19,893	31,926
All Other	2,426	3,540	6,020	22,043	23,295	24,102

Exchange Rate: 1984 $1 = 160.76 Pesetas; 1985 $1 = 170.04 Pesetas; 1986 $1 = 140.5 Pesetas.

(a) Countries without data are included in "All Other."

Source: Asociacion Espanola de Fabricentes de Maquinas-Herramienta.

SPANISH MACHINE TOOL EMPLOYMENT AND CONSUMPTION
Employment in Thousands, Values in Thousands of Dollars
(1974 to Date)

Year	Shipments	Imports	Exports	Consumption	Employment
1974	$206,873	$135,009	$ 69,789	$272,093	12.2
1975	223,117	168,693	86,532	305,277	11.6
1976	183,600	132,679	90,811	225,468	11.0
1977	190,872	91,373	102,529	179,716	10.5
1978	232,185	90,072	147,579	176,823	10.3
1979	315,829	91,322	210,766	196,385	10.0
1980	352,849	103,196	228,268	227,777	9.5
1981	319,957	142,038	207,038	254,957	8.8
1982	260,226	176,697	175,525	261,398	8.5
1983	188,245	86,244	99,427	175,063	7.6
1984	211,485	56,133	113,261	154,364	7.4
1985	252,881	58,895	151,452	160,324	7.3
1986	396,287	105,817	178,681	323,423	7.5

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramienta.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS

By Type of Machine, Units and Value, 1985 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1985		1986		1987	
	Units	Value	Units	Value	Units	Value
Engine & Turret Lathes, NC	388	$27,207	435	$50,005	361	$40,456
Vertical Boring & Turning Mills, NC	(a)	(a)	(c)	(c)	(c)	(c)
Turning Centers, NC	102	5,826	78	6,757	28(e)	4,691(e)
Other Lathes, NC	(a)	(a)	155(c)	39,626(c)	99(c)	28,372(c)
Engine Lathes, non-NC	518	10,556	560	13,038	327	10,199
Copying, Multi-Tool & Semi-Automatic Turret Lathes, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Single-Spindle Automatic Lathes, non-NC	82	1,738	36	1,092	(a)	(a)
Other Lathes, non-NC	(a)	(a)	25	1,633	(a)	(a)
Comb. Boring & Milling Machines, NC	8	6,727	(a)	(a)	(a)	(a)
Comb. Boring & Milling Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Boring Machines, NC	—	—	—	—	—	—
Boring Machines, non-NC	17	735	(a)	(a)	(a)	(a)
Milling Machines, NC	303	41,233	369(b)	70,141(b)	297	47,426
Knee-Type Milling Machines, non-NC	675	11,470	454	12,911	228	8,854
Bed-Type Milling Machines, non-NC	99	3,928	63	2,523	297	6,324
Other Milling Machines, non-NC	357	2,307	508	6,299		
Drilling Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Comb. Drilling & Boring Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Radial Drilling Machines, non-NC	69	659	81	902	39	244
Bench Type Drilling Machines, non-NC	2,216	1,794	2,301	2,932	1,738	2,744
Pillar Type Driling Machines, non-NC	(a)	(a)	987(f)	3,117(f)	570(f)	1,956(f)
Column Type Drilling Machines, non-NC	17	117	(a)	(a)	(a)	(a)
Grinding Machines, NC	16	2,523	13	2,710	7	1,129
Universal Tool & Cutter Grinding Machines, non-NC	2,772	3,130	3,127	4,295	3,067	3,033
Single Point Cutting Tool Sharpening Machines, non-NC						
Cutter Sharpening Machines, non-NC						
Other Tool & Cutter Grinding Machines, non-NC						
Universal Cylindrical Grinding Machines, non-NC	21	608	37	1,457	421	10,374
Internal Cylindrical Grinding Machines, non-NC	350	11,011	425	2,710		
External Cylindrical Grinding Machines, non-NC						
Surface Grinding Machines, non-NC						
Other Grinding Machines, non-NC						
Screw Cutting Machines, non-NC	(a)	(a)	—	—	—	—
Tapping Machines, non-NC	196	322	219	421	(a)	(a)
Planing Machines, non-NC	—	—	—	—	—	—
Slotting & Shaping Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Surfacing Machines, non-NC	8,879	2,091	8,775	2,625	5,921	2,379
Polishing, Honing & Lapping Machines, non-NC	230	2,340	211	3,180	323	3,934
Broaching Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Gear Cutting Machines, non-NC	—	—	—	—	—	—
Sawing & Cut-Off Machines, non-NC	895	2,724	738	3,345	777	3,558
Band Sawing Machines, non-NC	294	1,997	330	2,766	384	4,060
Other Sawing or Cut-Off Machines, non-NC	(a)	(a)	(a)	(a)	593(g)	2,516(g)
Spark Erosion Machines, non-NC	215	2,136	310	4,974	230	5,396
Transfer Lines	260	92,215	157	66,214	455	112,154
Unit Heads	642	3,950	586	2,584		
Machining Centers	230	38,991	263	44,698	265	46,672
Other Metal Cutting Machines, NC	51	18,074	220	43,438	786	96,021
Other Metal Cutting Machines, non-NC	13,266	14,382	9,801	35,463	8,958	78,305
Total Metal Cutting, NC	1,365(d)	247,076(d)	1,876	334,041	2,259	394,299
TOTAL METAL CUTTING	36,690(d)	353,816(d)	32,918	471,304	27,416	556,058

Exchange Rate: 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

(a) Data withheld.
(b) Does not include "Other Milling Machines, NC."
(c) "Vertical Boring & Turning Mills, NC" are included in "Other Lathes, NC."
(d) Does not include "Copying Lathes, NC."
(e) Does not include "Vertical Turning Centers, NC."
(f) Does not include pillar type drilling machines less than 15mm.
(g) Does not include hack sawing machines.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS
By Type of Machine, Units and Value, 1985 to Date
(values in Thousands of U.S. Dollars)

Type of Machine	1985		1986		1987	
	Units	Value	Units	Value	Units	Value
Sheet Metal Bending Machines, non-NC	147	$ 1,418	176	$ 2,036	60	$ 1,662
Sheet Metal Folding Machines, non-NC	874	1,443	1,065	2,625	722	1,411
Sheet Metal Straightening Machines, non-NC	(a)	(a)	238	2,080	(a)	(a)
Bar & Tube Drawing Machines, non-NC	(a)	(a)	—	—	(a)	(a)
Straightening Machines, non-NC	(a)	(a)	—	—	—	—
Profiling, Flanging & Molding Machines, non-NC	64	1,314	80	2,474	70	2,724
Other Bending Machines, non-NC	57	330	149	607	130	518
Punching, Shearing & Comb. Punching & Shearing Machines, NC	(a)	(a)	(a)	(a)	(a)	(a)
Mechanical Shearing Machines, non-NC	105	1,037	84	948	11	260
Hydraulic Shearing Machines, non-NC	701	10,343	(a)	(a)	(a)	(a)
Other Shearing Machines, non-NC	765	638	1,040	8,478	941	8,175
Punching Machines, non-NC	(a)	(a)	104	1,124	(a)	(a)
Comb. Punching & Shearing Machines, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Wireworking Machines, non-NC	108	4,932	64	3,013	80	7,519
Presses, NC	15	2,124	(a)	(a)	(a)	(a)
Open Front Mechanical Presses, non-NC	370	2,290	417	6,045	(a)	(a)
Single or Double Action, non-NC	(a)	(a)				
Forging, Stamping & Percussion Presses, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Presses w/Automatic Feed, non-NC	(a)	(a)	(a)	(a)	(a)	(a)
Mechanical Press Brakes, non-NC	—	—	—	—	—	—
Hydraulic Press Brakes, non-NC	678	9,307	376	8,944	144	4,610
Drop & Air Hammers, non-NC	—	—	—	—	—	—
Open Front Hydraulic Presses, non-NC	134	2,193	156	3,062	155	5,767
Other Hydraulic Presses, non-NC	85	3,170	170	7,372	108	5,244
Other Metal Forming Machines, NC	(a)	(a)	178	3,490	85	19,918
Other Metal Forming Machines, non-NC	(a)	(a)	194	14,831	815	29,497
Total Metal Forming, NC	615	23,999	732	37,276	661	45,397
TOTAL METAL FORMING	6,399	90,921	6,101	116,816	5,696	141,245

Exchange Rate: 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

(a) Data withheld.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH PRODUCTION AND EXPORTS OF NC MACHINES (a)

Units and Value, 1970 to Date

(Values in Millions of U.S. Dollars)

	Production		Exports	
Year	Units	Value	Units	Value
1970	147	$ 11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2
1981	1,238	208.4	NA	NA
1982	1,246	192.4	NA	NA
1983	1,295(b)	255.1(b)	NA	NA
1984	1,625(c)	225.9(c)	NA	NA
1985	D	D	NA	NA
1986	2,608	371.3	NA	NA
1987	2,920	439.7	NA	NA

NA - Not Available. D - Withheld to avoid disclosure.

(a) The survey covered metalworking and woodworking manufacturers.
(b) Does not include Surface Grinding Machines.
(c) Does not include Spark Erosion Machines.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH MACHINE TOOL INDUSTRY

Selected Data, 1983 to Date

(Values in Millions of U.S. Dollars)

	1983	1984	1985	1986	1987
Employment	15,502	13,443	12,050	11,450	10,025
Production Workers	8,982	7,656	6,670	6,160	5,375
Others	6,520	5,787	5,380	5,290	4,650
Average Weekly Hours	37.8	38.0	38.8	NA	NA
Compensation	$ 197.0	$156.8	$149.8	$197.8	$211.3
Wages	90.1	72.0	65.3	82.8	88.4
Salaries	106.8	84.8	84.5	115.0	122.9
Orders(a)	$ 489.9	$474.0	$490.4	$613.9	$757.3
Domestic	320.1	315.7	301.9	410.3	497.6
Foreign	169.8	158.3	188.5	203.6	259.7
Shipments(a)	$ 560.1	$465.5	$499.3	$657.4	$766.1

NA - Not Available.

Exchange Rates: 1983 $1 = 7.6213 Francs; 1984 $1 =8.7391 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH EXPORTS OF MACHINE TOOLS

By Destination, Value, 1984 to Date

(Thousands of U.S. Dollars)

Destination	1984	1985	1986	1987
TOTAL	$250,114	$208,604	$308,071	$284,274
WESTERN EUROPE				
Austria	1,375	1,706	3,166	2,326
Belgium-Luxembourg	6,594	7,153	13,190	12,281
Denmark	NA	NA	1,333	2,560
Finland	837	NA	3,482	2,498
Italy	9,406	8,780	19,004	21,223
Netherlands	3,003	3,267	5,320	5,385
Norway	778	[illegible]	3,978	1,598
Portugal	5,081	[illegible]41	2,039	3,126
Spain	5,048	[illegible],770	6,359	12,408
Sweden	2,492	2,753	3,887	4,774
Switzerland	8,777	9,116	17,993	18,844
Turkey	671	4,419	3,830	NA
United Kingdom	10,945	12,655	16,612	17,419
West Germany	21,113	27,280	39,179	50,696
EASTERN EUROPE				
Bulgaria	1,905	1,305	1,597	NA
Czechoslovakia	1,340	1,348	3,679	1,918
East Germany	1,926	9,618	21,605	5,759
Poland	3,241	1,284	995	2,655
U.S.S.R.	11,636	10,793	5,495	23,968
Yugoslavia	8,331	4,044	642	728
NORTH AMERICA				
Canada	7,531	3,116	6,648	4,456
Mexico	35,546	2,947	864	NA
United States	23,427	18,813	41,028	14,954
SOUTH AMERICA				
Brazil	NA	NA	NA	1,391
ASIA				
India	3,396	5,986	2,813	2,890
Indonesia	1,246	2,709	666	968
Israel	3,881	NA	2,059	932
Japan	1,364	NA	1,524	2,150
People's Rep. of China	2,225	4,314	5,840	4,501
Saudi Arabia	4,379	NA	1,332	1,098
Singapore	1,234	NA	NA	880
Taiwan	1,743	NA	1,422	3,734
OCEANIA				
Australia	1,895	2,671	5,734	4,368
AFRICA				
Algeria	12,724	13,200	24,566	13,600
Egypt	2,045	1,626	4,055	2,669
Morocco	3,282	3,191	3,345	2,686
Rep.of S. Africa	2,072	NA	860	1,407
Tunisia	3,789	2,108	5,431	3,598
Zaire	1,776	1,263	1,528	934
OTHER	30,900	33,663	24,971	26,892

NA - Not available; exports, if any, are included in "Other."

Exchange Rate: 1984 $1 = 8.7401, 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH IMPORTS OF MACHINE TOOLS
By Origin, Value, 1984 to Date
(Thousands of U.S. Dollars)

Destination	1984	1985	1986	1987
TOTAL	$301,173	$357,549	$617,994	$738,111
WESTERN EUROPE				
Austria	1,274	3,554	4,901	8,864
Belgium-Luxembourg	6,899	9,786	21,975	17,490
Denmark	943	762	1,588	2,478
Finland	427	551	346	1,563
Ireland	543	173	269	165
Italy	54,170	64,820	119,785	152,775
Netherlands	3,003	3,461	4,663	3,776
Norway	43	91	444	971
Portugal	106	186	127	392
Spain	8,287	8,613	17,569	22,410
Sweden	2,813	3,900	6,532	5,309
Switzerland	46,277	51,370	91,163	108,236
United Kingdom	10,759	14,405	26,418	35,284
West Germany	99,114	111,240	182,716	225,568
EASTERN EUROPE				
Bulgaria	211	776	408	536
Czechoslovakia	914	555	3,355	2,529
East Germany	3,089	2,917	7,251	6,593
Hungary	84	408	922	132
Poland	358	484	2,594	1,184
Rumania	1,125	1,402	1,561	1,238
U.S.S.R.	1,052	1,682	1,401	2,851
Yugoslavia	136	73	162	144
NORTH AND SOUTH AMERICA				
Canada	113	1,970	258	54
United States	14,251	11,874	30,347	24,771
Brazil	157	14	82	310
ASIA				
People's Rep. of China	578	170	701	2,230
Israel	NA	216	39	24
Japan	35,963	53,685	77,474	84,627
South Korea	43	NA	492	799
Taiwan	5,182	4,964	7,414	14,147
OTHER	3,259	3,447	5,038	10,659

NA - Not available; imports, if any, are included in "Other."

Exchange Rate: 1984 $1 = 8.7401 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

FRENCH FOREIGN TRADE IN MACHINE TOOLS
By Type of Machine, Value, 1984 to Date
(Thousands of U.S. Dollars)

Types of Machine	1984	1985	1986	1987
TOTAL IMPORTS	$301,173	$357,549	$617,994	$738,111
Metal Cutting Total (including NC)	205,620	261,131	461,143	548,176
Boring Machines (including NC)	11,887	19,478	31,095	26,195
Boring Machines, NC	6,215	16,455	25,555	19,311
Drilling Machines (including NC)	19,639	13,548	21,667	31,925
Drilling Machines, NC	11,543	6,873	12,411	13,967
Gear Cutting	4,496	3,485	9,804	13,840
Grinding & Polishing	38,277	46,851	80,256	117,410
Lathes (including NC)	58,113	72,191	112,513	128,506
Lathes, NC	41,908	49,370	78,314	90,674
Milling Machines (including NC)	27,827	32,630	58,420	81,142
Milling Machines, NC	17,396	21,046	37,321	52,281
Other Metal Cutting	45,380	72,949	147,388	149,156
Metal Forming Total	95,553	96,417	156,851	189,935
Hydraulic Presses, non-NC	4,716	2,837	7,481	6,230
Mechanical Presses, non-NC	19,574	16,211	26,552	27,585
Presses, NC	1,606	3,313	8,479	5,638
Forging Machines	3,821	4,254	2,925	5,890
Punching, Shearing, Bending and Forming Machines	38,756	37,477	61,799	79,885
Wire Drawing Machines	6,035	7,177	13,442	11,203
Other Metal Forming	21,043	25,150	36,173	53,504
TOTAL EXPORTS	$250,114	$208,604	$308,071	$284,274
Metal Cutting Total (including NC)	164,534	125,456	190,805	167,762
Boring Machines (including NC)	2,738	3,105	9,008	3,164
Boring Machines, NC	783	949	4,970	1,279
Drilling Machines (including NC)	8,620	7,810	22,762	10,779
Drilling Machines, NC	1,938	1,080	14,574	2,336
Gear Cutting	1,090	1,240	1,045	2,726
Grinding & Polishing	52,724	26,767	27,971	31,069
Lathes (including NC)	33,245	34,983	57,043	53,030
Lathes, NC	12,983	11,940	16,261	18,463
Milling Machines(including NC)	44,849	28,789	39,984	35,454
Milling Machines, NC	28,020	11,910	18,080	19,884
Other Metal Cutting	21,268	22,761	32,992	31,541
Metal Forming Total	85,580	83,148	117,266	116,512
Hydraulic Presses, non-NC	3,633	2,825	7,206	5,492
Mechanical Presses, non-NC	11,376	10,198	12,972	18,691
Presses, NC	367	802	2,720	8,333
Forging Machines	3,033	1,132	814	1,538
Punching, Shearing, Bending and Forming Machines	27,663	32,645	43,265	41,097
Wire Drawing Machines	6,329	2,954	3,262	4,623
Other Metal Forming	33,179	32,592	47,027	36,737

NA - Not Available.

Exchange Rate: 1984 $1 = 8.7401 Francs; 1985 $1 = 8.9852 Francs; 1986 $1 = 6.9261 Francs; 1987 $1 = 6.0107 Francs.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat de la Machine Outil, de l'Assemblage et de la Productique associee.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination 1984 to Date

(Thousands of U.S. Dollars)

Countries	1984	1985	1986	1987
TOTAL IMPORTS	$182,470	$196,449	$346,794	$ 566,484
West Germany	75,583	76,673	127,448	214,847
Switzerland	34,548	39,855	72,713	103,838
United States	13,546	12,412	12,745	20,545
Japan	8,765	11,627	28,240	54,532
France	8,594	8,432	16,099	20,927
United Kingdom	7,570	7,699	18,446	29,060
Belgium-Luxemborg	5,122	3,928	13,885	17,889
East Germany	3,984	3,771	7,513	10,586
Sweden	3,870	9,794	9,056	9,154
Spain	3,187	3,352	5,970	14,767
Taiwan	569	1,047	2,683	10,470
U.S.S.R.	2,675	5,604	6,439	8,205
Czechoslovakia	1,992	2,200	5,098	8,528
Netherlands	2,106	4,190	2,683	(a)
Austria	2,390	890	6,507	18,067
Other Imports	7,173	4,975	11,269	25,069
TOTAL EXPORTS	$557,997	$707,395	$969,681	$1,048,529
West Germany	59,818	103,121	139,791	156,956
United States	57,826	94,113	129,528	85,944
France	54,013	64,628	118,728	136,287
U.S.S.R.	45,248	42,422	73,115	77,197
Turkey	28,002	35,351	14,288	19,686
United Kingdom	26,010	31,266	42,729	38,270
Switzerland	22,425	21,787	41,588	53,178
Netherlands	6,830	10,422	15,093	(b)
Yugoslavia	7,285	6,128	13,617	13,834
Bulgaria	5,009	8,537	10,196	(b)
Algeria	10,529	15,450	16,837	16,265
China	10,017	26,396	47,693	28,531
Sweden	9,789	12,517	19,050	27,099
Belgium-Luxemborg	9,676	13,355	21,800	19,145
Austria	8,879	9,532	18,514	19,740
Spain	8,253	10,527	20,123	53,210
Greece	7,797	7,437	10,464	9,192
Poland	7,968	10,422	10,464	9,911
Egypt	10,928	7,646	9,458	(b)
Canada	7,740	24,301	28,642	16,206
Other Exports	153,955	152,037	167,963	267,877

(a) Included in "Other Imports."
(b) Included in "Other Exports."

Exchange Rate: 1984 $1 = 1,757.0 Lire; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire; 1987 $1 = 1,296.1 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiani Macchine Utensili

ITALIAN EXPORTS OF MACHINE TOOLS

1984 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1984	1985	1986	1987
TOTAL	$557,997	$707,395	$969,679	$1,048,529
Lathes	54,963	75,305	77,106	95,424
Boring Machines	35,825	34,046	43,962	36,140
Milling Machines	47,575	92,515	148,005	126,521
Drilling Machines	23,563	27,954	32,352	35,911
Broaching Machines	1,028	6,424	3,424	6,712
Grinding Machines	47,271	58,431	86,442	100,843
Gear Cutting Machines	2,337	2,213	6,515	8,521
Shaping-Slotting Machines }	22,923	26,119	37,206	1,769
Sawing-Cutting Off Machines }				46,077
Presses	51,234	62,035	100,963	123,571
Shears and Punching Machines	21,306	25,652	44,702	35,182
Bending Machines	27,170	29,207	38,980	47,712
Forging Machines	4,892	10,281	12,999	9,389
All Others	217,910	257,213	337,024	374,756

NA - Not Available.

Exchange rates: 1984 $1 = 1,757.0 Lire; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire; 1987 $1 = 1,296.1 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiani Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS

1984 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1984	1985	1986	1987
TOTAL	$182,470	$196,449	$346,810	$566,484
Lathes	30,887	34,695	73,481	118,929
Boring Machines	7,294	7,950	9,431	17,888
Milling Machines	13,966	19,182	38,192	70,504
Drilling Machines	6,775	5,304	16,151	22,318
Broaching Machines	(a)	(a)	(a)	312
Grinding Machines	22,516	24,780	29,249	51,181
Gear Cutting Machines	4,925	3,706	7,706	16,479
Shaping-slotting Machines }	6,506	7,846	12,946	2,305
Sawing-Cutting Off Machines }				14,859
Presses	12,178	11,099	23,308	29,345
Shears and Punching Machines	7,690	9,476	13,253	30,151
Bending Machines	4,929	6,313	8,648	13,981
Forging Machines	622	906	1,410	6,233
All Others (a)	64,182	65,192	113,486	171,998

(a) In 1984, 1985 and 1986 Broaching Machines were included in "All Others."

Exchange rates: 1984 $1 = 1,757.0; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire; 1987 $1 = 1,296.1 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiani Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS

By Weight and Value, 1973 to Date

(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

Year	Shipments		Imports		Exports	
	Weight	Value	Weight	Value	Weight	Value
1973	162.0	$ 620.9	55.6	$187.0	57.2	$ 236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	359.0
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981	NA	1,539.4	44.0	300.3	86.3	795.2
1982	NA	1,138.6	25.6	208.6	70.9	639.9
1983	NA	1,037.0	NA	181.8	NA	603.4
1984	NA	996.0	NA	182.5	NA	558.0
1985	NA	1,115.5	NA	196.4	NA	707.4
1986	NA	1,624.6	NA	346.8	NA	969.7
1987	NA	2,235.2	43.5	566.5	85.1	1,048.5

NA - Not Available.

Exchange Rate: 1973 $1 = 583.0 Lire; 1974 $1 = 650.3 Lire; 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.55 Lire; 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0; 1985 $1 = 1,909.4 Lire; 1986 $1 = 1,490.8 Lire; 1987 $1 = 1,296.1 Lire.

Source: Unione Costruttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS

Cutting & Forming, By Type of Machine, 1986 and 1987

(Thousands of U.S. Dollars)

Machine Classification	Production		Imports		Exports	
	1986(r)	1987E	1986	1987	1986	1987
GRAND TOTAL	$336,015	NA	$288,749	$387,358	$238,306	$275,891
Total Metal Cutting	148,132	$158,501	173,440	222,816	99,627	120,553
Drilling Machines	16,599	NA	5,999	10,196	12,748	10,775
Gear Cutting Machines	—	NA	819	6,754	217	515
Grinding and Polishing	64,951	NA	25,541	32,902	43,153	65,700
Lathes	34,867	NA	46,928	56,052	28,811	21,926
Milling Machines	30,240	NA	36,087	37,503	11,932	19,024
Broaching Machines	—	NA	984	945	46	44
Planers and Shapers	—	NA	493	482	75	29
Other Metal Cutting Machine	1,474	NA	56,589	77,982	2,645	2,541
Total Metal Forming	88,623	99,258	55,820	89,532	64,977	72,197
Hammers incl. Other Forging	1,205	NA	605	1,325	534	1,309
Presses	22,779	NA	8,757	22,823	24,327	19,540
Punching and Shearing Machines	11,580	NA	23,383	27,093	16,331	22,454
Other Metal Forming Machines	53,058	NA	23,075	38,291	23,785	28,894
Parts and Accessories	99,260	NA	59,490	75,010	73,702	83,141

E - Estimate. r - Revised. NA - Not Available.

Exchange Rate: 1986 $1 = 7.1236 Kronor; 1987 $1 = 6.3404 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Country, 1985 to Date

(Thousands of U.S. Dollars)

Country	Imports 1985	Imports 1986	Imports 1987	Exports 1985	Exports 1986	Exports 1987
TOTAL	$157,000	$229,259	$312,348	$139,436	$164,603	$192,751
Europe	116,207	175,909	240,780	88,599	117,929	137,206
Austria	1,418	6,701	4,131	1,222	3,434	2,610
Belgium	1,332	3,871	4,962	458	2,279	2,488
Denmark	4,852	6,909	8,294	10,291	13,101	8,732
Finland	2,483	4,095	6,299	6,973	7,401	11,029
France	2,810	2,920	4,244	3,706	5,655	5,253
Italy	12,307	16,518	40,951	9,467	10,613	10,683
Netherlands	1,711	4,465	5,271	2,856	4,545	4,403
Norway	508	758	1,728	6,384	9,446	12,073
Portugal	23	122	846	97	481	386
Spain	4,663	5,991	9,091	1,759	526	1,253
Switzerland	11,840	22,453	22,577	2,344	3,619	4,314
United Kingdom	11,023	9,279	17,417	12,270	21,162	20,790
West Germany	56,103	82,508	103,080	17,192	26,685	39,589
East European Bloc	5,039	9,011	11,451	10,752	5,515	11,294
Czechslovakia	3,034	4,503	4,901	626	181	914
U.S.S.R.	643	757	609	5,670	777	2,439
Other East Bloc(a)	1,362	3,751	5,941	4,455	4,557	7,941
All Other Europe	95	308	436	2,827	3,473	2,306
United States	4,462	4,341	8,886	31,521	22,257	25,978
Canada	65	168	347	3,068	3,070	3,597
South & Central America	—	52	17	1,475	1,205	7,346
Japan	34,269	45,939	53,419	1,901	1,036	586
China	78	179	502	1,610	7,577	2,581
Taiwan	1,705	2,207	7,180	201	129	369
All Other Asia	177	417	1,217	6,572	7,882	10,033
Africa	—	—	—	2,933	2,241	2,363
All Other	36	48	1	1,558	1,276	2,690

Exchange Rate: 1985 $1 = 8.6039 Kronor; 1986 $1 = 7.1236 Kronor; 1987 $1 = 6.3404 Kronor.

(a) Includes Bulgaria, GDR, Hungary, Poland and Romania.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

NUMBER OF COMPANIES AND EMPLOYEES IN THE SWEDISH MACHINE TOOL INDUSTRY

	1982	1983	1984	1985	1986	1987E
Number of Companies	36	36	35	36	33	NA
Number of Employees	3,200	3,000	3,000	3,070	3,100	3,000

E - Estimate. NA - Not Available.

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS

1985 to Date(a)

(Thousands of U.S. Dollars)

	Exports			Imports		
	1985	1986	1987	1985	1986	1987
GRAND TOTAL	$836,292	$1,259,912	$1,435,756	$170,032	$313,164	$360,113
Argentina	1,598	3,085	NA	—	—	NA
Australia	7,049	7,396	NA	—	4	NA
Austria	14,995	21,218	NA	3,919	5,647	5,700
Belgium-Luxembourg	7,611	13,792	NA	1,201	3,190	NA
Brazil	3,413	9,941	NA	—	41	NA
Bulgaria	19,406	42,373	44,394	20	67	NA
Canada	8,971	14,120	NA	27	27	NA
People's Rep. of China	26,272	51,768	35,072	—	1	NA
Czechoslovakia	17,714	24,509	NA	998	1,972	NA
Denmark	7,200	10,663	NA	936	1,563	NA
East Germany	3,314	12,537	72,800	208	380	NA
Finland	2,903	8,231	NA	96	148	NA
France	49,790	94,467	113,130	8,714	17,614	18,710
Hungary	2,433	2,970	NA	206	496	NA
India	13,583	19,485	NA	127	124	NA
Indonesia	421	2,710	NA	—	—	NA
Iran	3,474	9,158	NA	—	2	NA
Israel	4,042	6,015	NA	68	233	NA
Italy	45,694	72,970	103,809	20,430	35,011	47,546
Japan	62,665	53,977	47,277	27,460	48,684	48,619
Mexico	6,675	5,383	NA	61	—	NA
Netherlands	13,182	19,800	NA	1,117	3,860	3,755
Pakistan	2,113	1,622	NA	—	—	NA
Poland	10,008	12,554	NA	15	12	NA
South Africa	3,341	3,714	NA	44	168	NA
Spain	6,255	11,828	NA	1,956	2,928	4,158
Sweden	13,875	26,376	NA	2,074	3,740	NA
Taiwan	4,561	5,574	NA	518	3,936	7,846
United Kingdom	38,996	48,821	36,749	5,393	7,019	7,511
United States	123,453	134,419	119,166	5,253	5,325	3,822
U.S.S.R.	61,302	84,910	108,235	557	1,522	NA
West Germany	187,720	342,791	394,313	87,990	168,078	193,737
Yugoslavia	3,968	15,777	NA	5	20	NA
All Other	58,293	64,958	NA	639	1,352	NA

NA - Not Available.

Exchange Rate: 1985 $1 = 2.4571 Swiss Francs; 1986 $1 = 1.7989 Swiss Francs; 1987 $1 = 1.4912 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen-Industrieller.

NETHERLANDS SALES OF MACHINE TOOLS AND PARTS

By Machine Types, 1982 to Date

(Thousands of U.S. Dollars)

Type of Machine	1982	1983	1984	1985(r)	1986(r)	1987(p)
GRAND TOTAL	$50,521	$29,326	$34,406	$50,791	$73,755	$47,980
Metal Cutting Machine Tools	22,545	12,894	17,827	28,753	45,102	28,621
Metal Forming Machine Tools	21,647	12,158	12,248	13,909	18,775	12,118
Hydraulic Presses	3,595	1,261	1,870	933	1,510	4,729
Mechanical Presses	4,382			1,054	1,020	
Bending, Forming, Straightening, Cutting & Edging	4,382	6,061	4,488	4,275	5,347	936
Other Metal Forming	9,288	4,835	5,890	7,647	10,898	6,453
Metal Cutting Parts & Accessories	3,221	4,275	4,332	8,129	9,878	7,241
Metal Forming Parts & Accessories	3,108					

p - Preliminary. r - Revised.

Exchange Rate: 1982 $1 = 2.6702 Guilders; 1983 $1 = 2.8541 Guilders; 1984 $1 = 3.2087 Guilders; 1985 $1 = 3.3214 Guilders; 1986 $ 1 = 2.45 Guilders; 1987 $1 = 2.0257 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Type of Machine, 1985 to Date

(Thousands of U.S. Dollars)

Type of Machine	Imports			Exports		
	1985	1986	1987	1985	1986	1987
TOTAL	$191,937	$326,735	$321,073	$97,971	$162,204	$172,661
Lathes	23,574	38,204	43,015	5,148	7,306	9,933
Milling Machines	34,022	60,898	59,978	14,392	27,224	23,422
Grinding, Honing and Polishing Machines	12,766	22,163	42,483	13,549	28,694	24,683
Hydraulic Presses	5,931	11,102	2,440	5,179	7,837	1,054
Other Presses	4,245	6,000	17,457	4,396	3,061	10,637
Bending, Forming, Straightening, Cutting and Edging Machines	24,779	42,327	39,364	18,516	30,531	37,457
Other Metalworking Machine Tools	30,319	44,490	31,008	7,617	9,306	11,109
Parts and Accessories	56,302	101,551	85,328	29,174	48,245	54,366

Exchange Rates: 1985 $1 = 3.3214 Guilders; 1986 $1 = 2.45 Guilders; 1987 $1 = 2.0257 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Mataal-Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1985 to Date

(Values in Thousands of U.S. Dollars)

Machine Classifications	1985		1986		1987	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$458,218	NA	$603,619	NA	$596,047
Boring Machinery & Parts	289	14,511	323	14,564	277	20,081
Drilling Machinery & Parts	15,243	13,218	17,884	13,459	20,012	17,345
Grinding Machinery & Parts	88,758	38,072	90,813	41,001	73,474	62,481
Automatic Lathes	1,082	40,861	977	39,121	1,318	67,672
Turret Lathes, N.E.C.	599	1,739	497	1,602	487	1,562
Lathes & Parts, N.E.C.	1,850	19,060	1,724	19,874	1,575	22,531
Milling Machines & Parts	1,965	24,739	2,122	32,576	2,196	43,801
Shapers, Gear Makers & Parts	739	17,974	548	13,540	724	12,706
Transfer Machines & Parts	20	50,740	41	62,207	43	14,801
Sawing Machines & Parts	NA	15,750	NA	15,832	NA	19,309
Metalworking Presses & Parts	1,819	49,069	1,452	153,152	1,774	111,124
Rolls, Bending Machines & Parts	NA	13,159	NA	17,244	NA	17,430
Shearing Machines & Parts	454	4,071	467	4,244	424	6,606
Metal Forging Stamping Machines & Parts	119	6,523	113	11,610	203	12,009
Can Making Machinery & Parts	NA	39,870	NA	49,571	NA	31,251
Machine Tools & Parts, N.E.C.	NA	108,862	NA	114,022	NA	135,340
TOTAL EXPORTS(a)	NA	$104,854	NA	$144,252	NA	$ 63,582
Boring, Drilling Machinery & Parts	686	7,104	202	6,138	191	2,575
Grinding Machinery & Parts	188	2,527	160	5,069	434	3,508
Lathes & Parts	251	4,382	229	3,516	137	2,915
Metalworking Presses & Parts	198	5,463	138	7,131	262	8,879
Machine Tools & Parts, N.E.C.	NA	85,378	NA	122,398	NA	45,705

NA - Not Available. N.E.C. - Not Elsewhere Classfied.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1985 $1 = 1.3655 Canadian dollars; 1986 $1 = 1.3895 Canadian dollars; 1987 $1 = 1.3260 Canadian dollars.

Source: Statistics Canada.

THE INDIAN MACHINE TOOL INDUSTRY
Production and Exports
(Values in Thousands of U.S. Dollars)

	Production						Exports	
	1985		1986		1987		1987	
Type of Machine	Unit	Value	Unit	Value	Unit	Value	Unit	Value
Total Machine Tools	9,284	$158,119	9,272	$153,750	10,475	$189,342	1,629	$45,717
Boring machines	86	9,904	69	7,988	81	11,184	16	2,388
Drilling machines	1,563	8,599	1,249	11,400	1,118	7,930	45	661
Milling machines	1,173	18,445	1,254	16,825	1,392	17,829	345	6,937
Gear cutting machines	45	2,018	36	2,945	48	3,699	12	816
Broaching machines	21	1,275	16	825	25	1,134	4	254
Lapping, honing, polishing machines	48	95	98	833	45	250	3	27
Machining centers	(a)	(a)	41	6,525	73	18,812	17	6,973
Automatic screw machines	663	15,674	554	15,751	630	16,359	141	11,984
Lathes	3,401	41,018	3,093	35,852	3,633	39,612	479	5,816
Grinding machines	888	13,404	1,198	16,543	1,673	21,449	437	8,785
Sawing machines	253	1,013	196	864	236	571	14	16
Shaping machines	145	2,093	127	2,036	55	699	2	12
Slotting machines	35	513	70	1,496	15	569	(a)	(a)
Screwing & threading	50	795	58	961	104	1,611	27	229
Presses	373	15,652	463	12,326	524	16,247	5	8
Shearing & sheet metal	172	5,190	160	4,934	162	2,376	4	29
Other	368	22,432	590	15,646	661	29,010	78	783

(a) Included in "Other."

Exchange Rate: 1985 $ 1 = 12.369 Rupees; 1986 $1 = 12.611 Rupees; 1987 $1 = 12.962 Rupees.

Source: Indian Machine Tool Manufacturers' Association (IMTMA)

TAIWAN'S PRODUCTION, IMPORTS, EXPORTS AND CONSUMPTION OF MACHINE TOOLS

By Type of Machine, 1987

(Thousands of U.S. Dollars)

Machine Classification	Production	Imports	Exports	Consumption
Grand Total	$577,828	$214,838	$379,926	$412,740
Lathes	99,181	15,830	69,426	45,585
Drilling Machines	88,897	16,419	62,226	43,088
Milling Machines	68,295	19,410	47,806	39,899
Grinding Machines	64,962	24,130	51,121	37,971
Sawing Machines	24,357	1,209	17,050	8,516
Shaping & Planing Machines	1,526	512	1,068	970
Boring Machines	5,229	3,129	3,660	4,698
Machining Centers	64,878	3,447	38,927	29,398
Gear Cutting Machines	193	7,902	116	7,979
Screw Cutting Machines	2,115	3,484	1,269	4,330
Electrical Discharge Machines	16,225	15,261	11,358	20,128
Presses	46,964	30,956	9,393	68,527
Other Machinery	95,006	73,150	66,504	101,652

Exchange Rate: $1 = 32.0 NT.

Consumption = Production + Imports − Exports.

Note: Individual items may not add to totals due to rounding.

Source: Taiwan Association of Machinery Industry.

TAIWAN PRODUCTION OF MACHINE TOOLS

By Type of Machine, 1983 to Date

(Values in Thousands of Dollars)

Machine Classifications	1983	1984	1985	1986	1987
Total Machines Tools	$210,962	$233,234	$282,072	$356,706	$577,828
Lathes	50,687	59,119	66,320	74,496	99,181
Drilling Machines	56,653	47,619	53,419	67,310	88,897
Milling Machines	36,001	36,626	38,584	47,804	68,295
Bench Grinders	0	0	0	0	28,238
Other Grinding Machines	14,179	18,827	43,772	59,795	36,724
Sawing Machines	10,264	13,398	15,030	18,587	24,357
Shaping & Planing Machines	2,658	2,391	2,682	905	1,526
Boring Machines	484	584	1,071	2,318	5,229
Machining Centers	8,054	15,180	17,029	40,458	64,878
Gear Cutting Machines	437	214	240	301	193
Screw Cutting Machines	0	0	0	0	2,115
Electrical Discharge Machines	0	0	0	0	16,225
Other Metal Cutting Machines	19,163	15,863	17,726	14,549	46,740
Presses (Punching & Shearing)	12,382	7,767	24,181	27,596	46,964
Other Metal Forming Machines	0	15,626	2,019	2,587	48,266

Exchange Rate: 1983 $1 = 39.0 NT; 1984 $1 = 41.2 NT; 1985 $1 = 39.5 NT; 1986 $1 = 37.0;
1987 $1 = 32.0 NT.

Note: Individual items may not add to totals due to rounding.

Source: Taiwan Association of Machinery Industry.

TAIWAN IMPORTS AND EXPORTS OF MACHINE TOOLS

By Type of Machine, 1983 to Date

(Values in Thousands of Dollars)

Machine Classifications	1983	1984	1985	1986	1987
TOTAL IMPORTS	$112,987	$113,273	$76,678	$82,454	$214,838
Lathes	9,753	10,835	7,608	7,795	15,830
Drilling Machines	5,428	4,932	6,985	5,612	16,419
Milling Machines	10,891	15,173	7,433	3,842	19,410
Grinding Machines	7,980	12,510	9,143	13,832	24,130
Sawing Machines	2,072	631	666	626	1,209
Shaping & Planing Machines	466	880	371	237	512
Boring Machines	5,806	1,872	1,662	2,037	3,129
Machining Centers	4,488	0	0	3,877	3,447
Gear Cutting Machines	3,205	2,587	2,413	1,114	7,902
Screw Cutting Machines	0	0	0	0	3,484
Electrical Discharge Machines	0	0	0	0	15,261
Other Metal Cutting Machines	38,825	18,301	15,927	17,053	12,352
Presses (Punching & Shearing)	24,072	45,551	24,470	26,428	30,956
Other Metal Forming Machines	0	0	0	0	60,798
TOTAL EXPORTS	$135,361	$164,802	$204,464	$254,162	$379,926
Lathes	33,518	44,408	46,746	60,080	69,426
Drilling Machines	50,737	48,223	43,332	54,282	62,228
Milling Machines	18,395	27,856	25,917	34,651	47,806
Bench Grinders	0	0	0	0	25,414
Other Grinding Machines	7,326	12,375	35,559	44,132	25,707
Sawing Machines	9,386	10,208	11,740	14,168	17,050
Shaping & Planing Machines	486	386	832	854	1,068
Boring Machines	198	417	765	1,552	3,660
Machining Centers	3,927	9,985	13,165	33,715	38,927
Gear Cutting Machines	76	5	156	151	116
Screw Machines	0	0	0	0	1,269
Electrical Discharge Machines	0	0	0	0	11,358
Other Metal Cutting Machines	8,735	8,723	8,980	3,677	32,718
Presses (Punching & Shearing)	2,577	2,217	17,272	6,899	9,393
Other Metal Forming Machines	0	0	0	0	33,786

Exchange Rate: 1983 $1 = 39.0 NT; 1984 $1 = 41.2 NT; 1985 $1 = 39.5 NT; 1986 $1 = 37.0; 1987 $1 = 32.0 NT.

Note: Individual items may not add to totals due to rounding.

Source: Taiwan Association of Machinery Industry.

KOREAN PRODUCTION OF MACHINE TOOLS

By Type, 1978 to 1987

(Millions of Dollars)

Machine Classifications	1978	1979	1980	1981	1982	1983	1984	1985(r)	1986(r)	1987
GRAND TOTAL	$113.9	$113.9	$92.3	$99.0	$124.8	$167.9	$219.9	$179.0	$334.3	$530.9
Metal Cutting Total	75.0	58.8	59.5	65.0	78.0	103.6	128.3	144.8	214.8	393.5
Lathes	57.8	36.9	41.0	35.0	32.0	37.6	46.5	40.2	46.1	64.6
NC Lathes	—	—	—	4.0	10.4	11.3	12.8	16.2	38.5	72.0
Milling	6.5	11.1	6.8	12.1	14.4	18.2	23.2	20.6	26.7	44.2
NC Milling	—	—	—	—	—	0.9	2.1	3.1	7.1	9.8
Drilling	4.8	4.9	2.7	3.8	2.8	5.1	6.3	6.7	8.8	13.5
Boring	1.2	1.6	1.3	2.4	3.1	1.9	2.6	3.1	3.4	6.1
Grinding	1.6	1.2	2.3	4.3	4.4	4.7	8.6	8.5	14.9	25.4
Electrical Discharge	—	—	—	—	1.3	1.0	4.8	2.7	6.1	14.6
Sawing	0.8	0.6	2.9	0.7	0.7	1.1	1.7	2.2	4.0	8.7
Gear Cutting	0.5	1.0	0.7	0.3	0.3	1.6	0.1	1.2	1.4	8.6
Tapping	—	—	0.2	0.2	0.1	0.5	1.0	0.7	1.0	2.3
Shaping	1.0	0.2	0.4	0.2	—	0.3	1.0	0.2	1.4	0.8
Planing	0.4	1.1	1.3	0.8	0.6	0.4	0.6	0.7	1.0	1.6
Special Purpose	—	—	—	—	1.7	4.5	3.3	7.6	19.3	66.1
Machining Centers	—	—	—	0.7	5.3	10.1	12.4	19.5	24.8	50.8
Other Metal Cutting	0.3	0.1	0.1	0.5	0.7	4.4	1.4	11.4	10.2	4.4
Metal Forming Total	39.0	55.1	32.7	34.0	46.8	64.3	91.6	34.2	119.5	137.4
Presses	24.2	46.7	17.5	19.0	31.7	39.1	58.0	24.7	103.3	119.2
Rolling Machines	5.4	3.7	5.6	1.2	4.2	8.3	3.5	4.1	7.4	8.2
Shearing	—	—	—	—	0.3	1.1	1.4	1.4	2.8	1.6
Wire Drawing	—	—	—	—	1.6	2.2	5.2	2.9	4.5	0.2
Bending	—	—	—	—	—	0.3	0.9	0.2	0.2	6.5
Other Metal Forming	9.4	4.8	9.7	13.8	9.1	13.2	22.5	0.8	1.4	1.8

r - Revised.

Exchange rate: 1978-1979 $1 = 484.00 Won; 1980 $1 = 607.43 Won; 1981 $1 = 681.03 Won; 1982 $1 = 731.08 Won; 1983 $1 = 775.75 Won; 1984 $1 = 805.98 Won; 1985 $1 = 870.02 Won; 1986 $1 = 881.45 Won; 1987 $1 = 822.57 Won.

Note: Individal items may not add to totals due to rounding.

Source: Korea Machine Tool Manufacturers' Association.

KOREAN EXPORTS OF MACHINE TOOLS

By Type of Machine, 1985 to 1987

(Thousands of Dollars)

Type of Machine	1985		1986		1987	
	Unit	Value	Unit	Value	Unit	Value
Total Machine Tools	12,987	$23,434	5,596	$27,727	33,385	$37,469
Metal Cutting Machine Tools	6,324	19,781	4,419	25,878	25,128	32,700
Lathes	1,510	8,890	1,370	8,592	8,980	6,228
NC Lathes	155	6,083	260	12,090	335	17,704
Milling	1,984	1,983	106	1,033	92	1,051
NC Milling	3	41	0	0	1	15
Drilling	1,037	246	95	156	141	166
NC Drilling	0	0	0	0	2	61
Boring	25	182	7	136	45	113
NC Boring	0	0	1	58	0	0
Grinding	791	817	351	529	137	657
Gear Cutting	147	108	25	537	86	319
Electrical Discharge	11	56	2	27	130	112
Machining Centers	19	1,048	35	1,820	84	4,794
Other Metal Cutting	642	327	2,167	900	15,095	1,480
Metal Forming Machine Tools	6,663	3,653	1,177	1,849	8,257	4,769

Exchange rate: 1985 $1 = 870.02 Won; 1986 $1 = 881.45 Won; 1987 $1 = 822.57 Won

Note: Individual items may not add to totals due to rounding.

Source: Korea Machine Tool Manufacturers' Association.

KOREAN IMPORTS OF MACHINE TOOLS

By Type of Machine, 1985 to 1987

(Thousands of Dollars)

Type of Machine	1985		1986		1987	
	Unit	Value	Unit	Value	Unit	Value
Total Machine Tools	29,616	$228,645	5,451	$357,961	12,910	$486,110
Metal Cutting Machine Tools	8,368	150,552	4,578	238,650	11,183	340,656
Lathes	208	9,681	392	15,651	1,469	29,198
NC Lathes	87	8,025	168	18,044	192	18,358
Milling	110	20,371	348	12,542	1,442	27,544
NC Milling	78	11,736	52	9,691	128	14,649
Drilling	539	19,341	606	10,259	1,095	19,363
NC Drilling	18	2,765	24	4,617	40	4,544
Boring	80	11,614	168	17,572	87	13,997
NC Boring	12	2,217	18	6,909	42	10,154
Gear Cutting	75	4,162	350	6,568	134	12,222
NC Gear Cutting	6	673	70	10,994	272	21,489
Grinding	680	27,986	696	60,535	2,791	80,403
Electrical Discharge	6,043	8,236	134	9,830	276	18,634
Machining Centers	27	5,894	28	8,480	50	11,191
Other Metal Cutting	405	17,851	1,524	46,958	3,165	58,910
Metal Forming Machine Tools	21,248	78,093	873	119,311	1,727	145,454

Exchange rate: 1985 $1 = 870.02 Won; 1986 $1 = 881.45 Won; 1987 $1 = 822.57 Won

Note: Individal items may not add to totals due to rounding.

Source: Korea Machine Tool Manufacturers' Association.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1983 to 1985

	Unit of Measure	1983	1984(r)	1985
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	190	188	182
Metal Cutting Machines(a)	Mill. Rubles	2,200	2,390	2,674
Metal Cutting Machines, NC	Units	11,400	13,300	17,600
Presses—Forging Machines	Thousands	57	55	53
Presses—Forging Machines(a)	Mill. Rubles	657	664	662
OTHER SELECTED PRODUCTS AND INDUSTRIES				
Electric Power	Bill. Kwh	1,418	1,492	1,545
Petroleum	Mill. Tons	616	613	595
Gas	Bill. Cu. Meters	536	587	643
Coal Incl. Coking Coal	Mill. Tons	716	712	726
Cast Iron	Mill. Tons	110	111	110
Steel	Mill. Tons	153	154	155
Rolled Ferrous Metal	Mill. Tons	122	123	128
Steel Pipe	Mill. Meters	2,711	2,738	2,747
Steel Pipe	Mill. Tons	19	19	19
Iron Ore	Mill. Tons	245	247	248
Instruments & Automation Equip. with Spare Parts(a)	Mill. Rubles	4,300	4,600	4,800
Computing Equip. with Spare Parts(a)	Mill. Rubles	3,300	3,700	4,200
Automobiles	Thousands	1,315	1,327	1,332

r - Revised.

(a) Data in wholesale prices.

Source: The U.S.S.R. in Figures for 1984 - U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

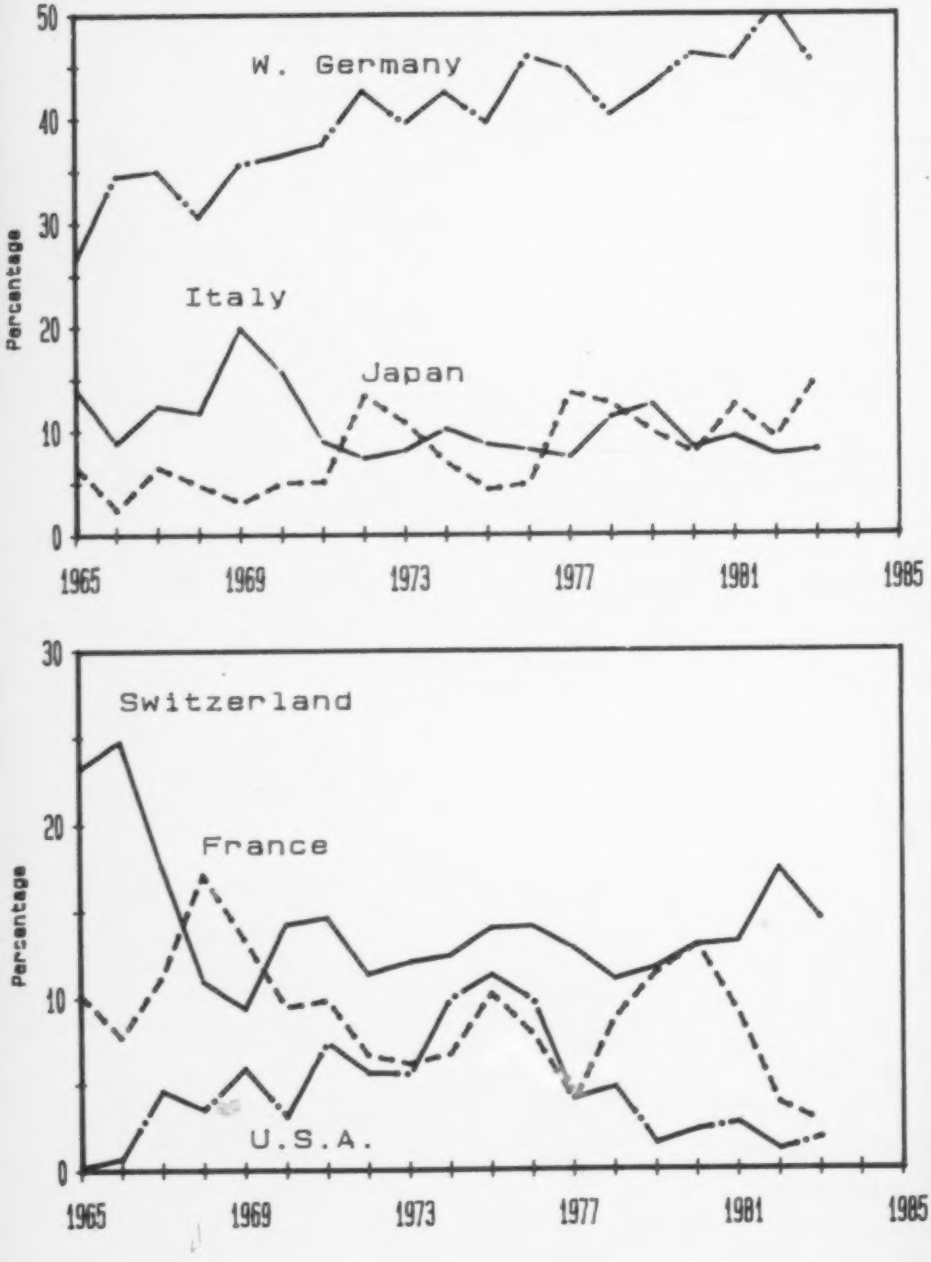
The official exchange rate: 1983 $1 = .743 rubles; 1984 $1 = .816 rubles; 1985 $1 = .838 rubles.

U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1940 to 1985

Year	Metal Cutting MachineTools	Forging Machines & Presses	Year	Metal Cutting MachineTools	Forging Machines & Presses
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,871	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980	216,000	57,200
1966	192,200	38,412	1981	205,000	57,100
1967	197,000	41,126	1982	195,000	57,300
1968	200,600	42,128	1983	190,000	57,400
1969	205,300	42,658	1984	188,000	55,300
1970	202,300	41,268	1985	182,000	52,700

Source: The U.S.S.R. in Figures for 1985—U.S.S.R. Central Statistical Administration.

EAST BLOC MACHINE TOOL IMPORTS
From Six Non-Communist Nations



EASTERN BLOC (a) MACHINE TOOL IMPORTS FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)

Total and Selected Nations, 1965 to 1983

(Values in Millions of U.S. Dollars)

Year	Total	United States		France		West Germany		Italy		Japan		Switzerland	
		Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)	Value	%(c)
1965	$ 60.9	$ .1	.2%	$ 6.2	10.2%	$ 16.0	26.3%	$ 8.5	14.0%	$ 4.0	6.6%	$ 14.1	23.2%
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.8	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	899.6	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	14.0
1976	976.8	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	1,127.8	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	1,331.3	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	1,243.8	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7
1980	998.4	23.4(e)	2.3	130.0	13.0	461.5	46.2	83.3	8.3	77.0	7.7	129.9	13.0
1981	719.9	19.6(e)	2.7	64.7	9.0	328.2	45.6	68.0	9.4	89.5	12.4	94.9	13.2
1982	667.9	7.1	1.1	25.2(i)	3.8	338.0	50.6	50.7	7.6	61.2(h)	9.2	116.0	17.4
1983	787.1	14.0(g)	1.8	21.0	2.7	352.7	44.8	63.7	8.1	118.7(i)	15.1	114.0	14.5

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland, Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.
(g) Does not include Hungarian imports.
(h) Does not include Polish imports.
(i) Does not include Romanian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports," Commodity Series, Machine Tools For Working Metals; and NMTBA.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)
U.S. and Selected Communist Countries
For selected years, 1960 to 1985

	1960	1970	1975	1980	1982	1983(r)	1984(r)	1985(r)	1986
United States (b)									
Million US $	$539.30	$1,097.70	$1,790.40	NA	NA	NA	NA	NA	NA
Thousand units	42.91	49.31	64.32	61.37	49.10	35.40	34.45	33.82	35.01
Communist Countries									
USSR and Eastern Europe									
USSR									
Million US $	$611.74	$1,427.88	$2,179.78	NA	NA	NA	NA	NA	NA
Thousand units	155.92	202.16	231.35	216.00	195.00	190.00	188.00	182.00	163.00
Bulgaria (thousand units)	3.15	13.94	16.28	18.87	17.90	15.12	15.20	17.20	19.46
Czechoslovakia(thousand units)	30.23	35.19	29.66	36.90	37.10	35.40	37.00	37.20	37.60
East Germany (thousand units)	41.90	22.22	19.72	17.50	18.00	20.40	20.70	21.90	23.21
Hungary (thousand units)	9.78	14.48	12.83	10.20	13.10	13.10	13.10	10.70	10.70
Poland (thousand units)	22.47	29.73	33.19	28.20	32.20	39.30	47.10	48.70	50.35
Romania (thousand units)	4.44	14.14	28.27	29.40	37.90	59.00	80.20	89.40	90.80
China (thousand units)(r)	153.50	138.90	174.90	133.60	99.80	121.00	133.50	167.20	159.00

NA - Not Available. r - Revised.

(a) Power-driven metal cutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include lathes and planers and milling, honing, lapping, grinding, electroerosion, and ultrasonic cutting machines.
(b) Average value of $1,000 and over for 1960-75 and beginning in 1980, $2,500 and over.
(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1987."

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)
U.S. and U.S.S.R.
For selected years, 1960 to 1986

	1960	1970	1975	1980	1982	1983	1984	1985	1986
United States									
Million US$	$238.4	$454.1	$615.7	NA	NA	NA	NA	NA	NA
Thousand units(b)	19.3	24.2	26.8	30.3	18.3	31.5	34.1	17.8	38.3
USSR									
Million US$	$188.3	$359.2	$581.1	NA	NA	NA	NA	NA	NA
Thousand units	29.9	41.3	50.5	57.2	57.3	57.4	55.3	52.7	51.4

NA - Not Available.

(a) Power-driven metal forming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.
(b) Average value of $1,000 and over for 1960-75 and beginning in 1980, $2,500 and over.
(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1987."

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COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)

1973 to 1977

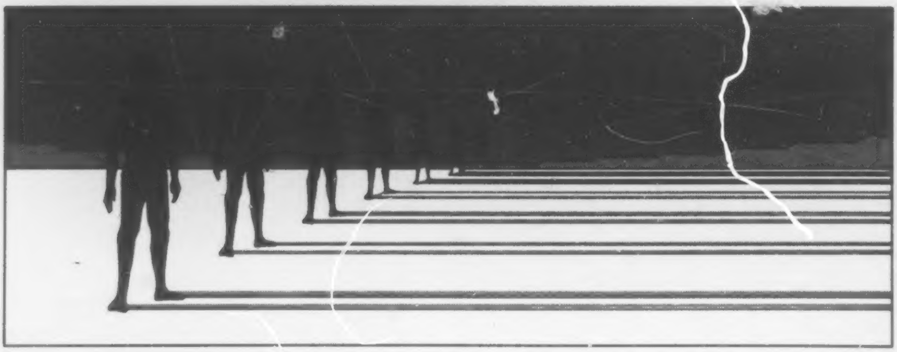
(Millions of U.S. Dollars)

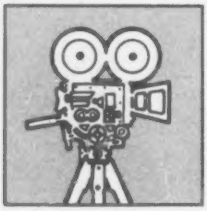
Exporting Country	Total(b)	Exported to: Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin America (e)
TOTAL							
1973	$ 9,143	$ 6,917	$638	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976	14,050	11,130	580	40	218	587	97
1977	15,605	12,726	665	45	250	785	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	1[illegible]2
1974	3,357	2,249	232	10	154	555	11
1975	3,553	2,051	252	17	136	540	22
1976	3,953	2,952	127	3	96	303	23
1977	4,759	3,538	153	3	115	28	
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1,404	128	16	54	134	35
1974	1,973	1,511	169	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	18	1	5	16	11
1974	1,002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

(a) Note that these figures are for machinery in general and not for machine tools only.
(b) Total includes Australia, New Zealand, South Africa and not specified.
(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.
(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.
(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau – Anstalten, VDMA, "Statistisches Handbuch fur den Maschinenbau" (annually).

The future of industry depends on new employees





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7

EMPLOYMENT AND EARNINGS

Relative to total U.S. Industry, the machine tool industry is small. If all the employees of the industry were to work for a single company, it would rank only about 60th among U.S. industrial corporations. These employment statistics demonstrate that the industry is characterized by a substantial number of small and medium-sized establishments.

Historically, industry employment has fluctuated sharply with changes in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry. When employment has to be cut due to business slowdown, some of the highly skilled labor force is lost. Conversely, when business recovers, there is typically a shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

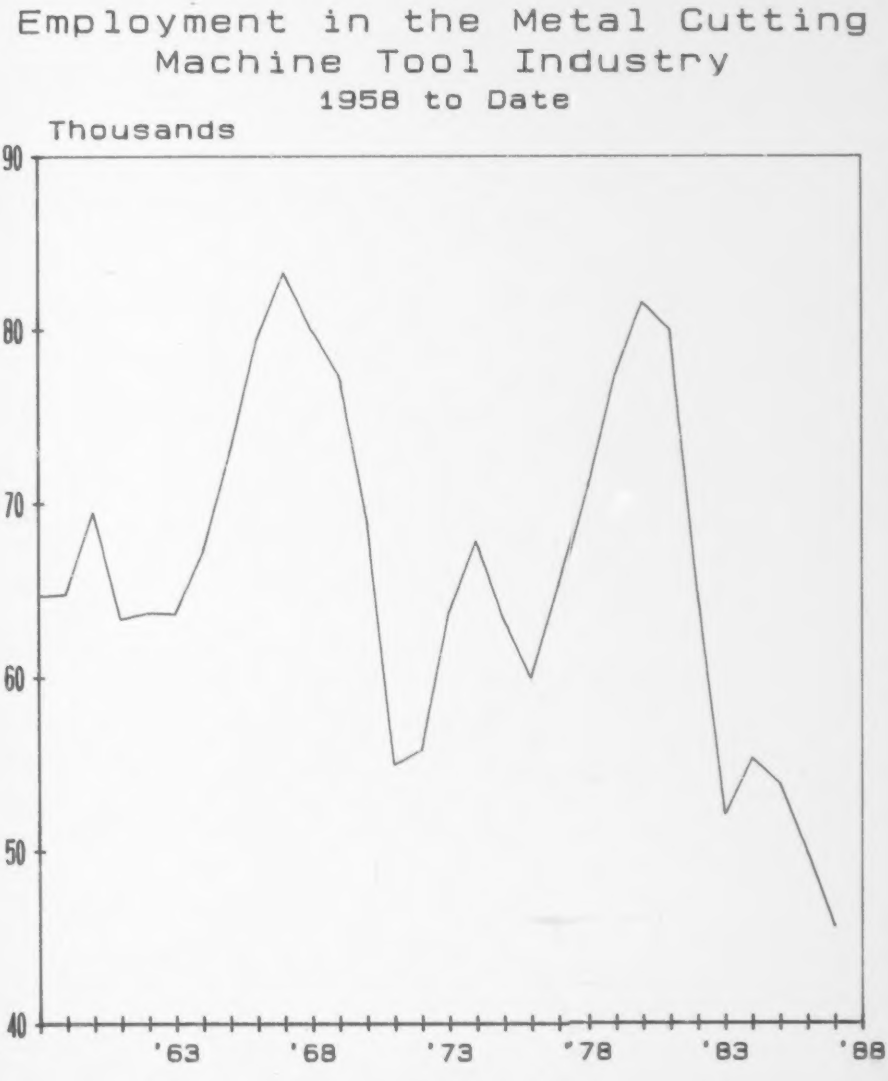
To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of labor supply problems. The advent of computers and electronics as major components of machine tools has led to a steady shift in both the nature and composition of the industry's workforce. While skilled machinists are still a mainstay of machine tool building operations, electronic engineers and computer professionals are becoming increasingly important.

Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $11.08 in 1987. Average earnings in the metal forming sector of the industry were $11.51. The average weekly hours worked in the industry were 42.1 for the metal cutting tool builders' employees, and 42.4 for the metal forming machine tool builders' employees.

Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in the U.S. has grown more rapidly than in other countries as a result of the dollar's strengthening during the first half of the 80's. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is by far the highest among the major machine tool producing nations. U.S. wage growth should slow significantly, relative to other industrialized nations, as a result of the dollar's decline in late 1986 and throughout most of 1987.

Most of the data in this chapter comes from the U.S. Department of Labor's Bureau of Labor Statistics, primarily from their monthly "Employment and Earnings" tabulation. Some of the data is obtained from the Bureau of the Census, primarily its annual "Survey of Manufacturers" series. The Census data may be more complete because it is based on the enumeration of all workers in SIC identified industries that is obtained in the "Census of Manufacturers." However, as the Census comes out only every five years and the "Survey of Manufacturers" is annual, the data from the BLS offers much more timely information with only a marginal loss of accuracy. For further explanation of the terms used in this chapter, see the Glossary at the end of this book.



EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

1958 to Date

(Average Annual Employment in Thousands)

	All Employees		Production Workers		Female Employees	
Year	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming
1958	64.7	NA	43.8	NA	6.3	NA
1959	64.8	NA	44.3	NA	6.0	NA
1960	69.5	NA	48.2	NA	6.5	NA
1961	63.3	NA	42.8	NA	5.9	NA
1962	63.7	NA	43.7	NA	5.8	NA
1963	63.6	NA	44.0	NA	5.7	NA
1964	67.1	NA	46.7	NA	5.8	NA
1965	72.8	NA	50.8	NA	6.2	NA
1966	79.4	NA	55.7	NA	7.1	NA
1967	83.3	NA	57.9	NA	7.9	NA
1968	80.0	NA	54.5	NA	7.6	NA
1969	77.4	NA	52.2	NA	7.4	NA
1970	69.2	NA	45.5	NA	6.8	NA
1971	54.9	NA	34.9	NA	5.4	NA
1972	55.8	NA	35.8	NA	5.5	NA
1973	63.7	NA	42.6	NA	6.4	NA
1974	67.8	NA	45.6	NA	7.1	NA
1975	63.3	NA	41.8	NA	6.5	NA
1976	59.9	NA	38.8	NA	6.4	NA
1977	65.2	23.3	41.9	15.4	7.3	NA
1978	70.9	25.0	45.9	16.5	8.4	NA
1979	77.4	26.9	51.2	17.7	9.7	NA
1980	81.6	26.4	54.7	17.0	10.6	NA
1981	80.0	24.4	52.0	15.3	10.7	NA
1982	64.9	21.0	39.3	12.6	8.8	2.[illegible]
1983	52.0	17.1	29.9	9.9	7.3	1.[illegible]
1984	55.3	18.6	33.7	11.4	8.0	1.[illegible]
1985(r)	53.8	19.2	33.9	11.8	8.1	2.[illegible]
1986(r)	49.9	19.5	31.4	11.9	7.6	2.[illegible]
1987(p)	45.6	19.0	28.7	11.9	7.1	2.[illegible]

r - Revised. p - Preliminary. NA - Not Available.

Note: The figures published by the Bureau of Labor Statistics are based on monthly sample surveys and differ from the figures shown by the Census.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84," monthly issues and annual supplements.

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS

Machine Tool Industry

Monthly, 1985 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1985(r)	1986(r)	1987(p)	1985(r)	1986(r)	1987(p)
Metal Cutting						
Jan.	34.8	32.8	29.9	42.8	43.0	42.1
Feb.	34.6	32.6	29.2	42.2	42.6	42.3
Mar.	34.6	32.4	29.1	42.5	42.7	42.3
Apr.	33.7	32.0	28.7	42.0	42.8	41.3
May	34.4	31.7	28.3	42.2	42.9	41.7
June	34.0	31.7	28.4	42.5	42.6	42.5
July	33.5	31.1	28.1	42.3	41.4	41.3
Aug.	33.4	30.9	28.1	42.5	41.7	41.7
Sept.	33.8	30.6	28.5	42.5	41.7	41.1
Oct.	33.3	30.3	28.5	42.6	41.7	42.3
Nov.	33.2	30.2	28.6	42.1	41.9	42.7
Dec.	33.2	30.1	28.8	45.1	43.3	43.8
Yearly Avg.	33.9	31.4	28.7	42.6	42.4	42.1
Metal Forming						
Jan.	12.0	11.9	11.9	41.4	42.4	41.2
Feb.	12.0	11.9	11.9	40.7	42.5	41.8
Mar	11.9	11.9	11.9	42.3	42.5	41.2
Apr.	11.8	11.8	11.9	41.8	42.4	40.4
May	11.8	11.9	11.9	41.4	41.6	41.7
June	11.8	12.1	11.9	42.0	42.0	42.1
July	11.8	11.7	11.6	41.3	41.4	41.4
Aug.	11.5	11.7	11.5	41.0	40.2	42.9
Sept.	11.7	11.9	12.1	42.7	41.5	43.2
Oct.	11.6	12.0	12.0	42.2	41.9	43.3
Nov.	11.8	11.8	12.2	42.8	42.5	44.6
Dec.	11.8	11.8	12.3	43.5	42.6	45.1
Yearly Avg.	11.8	11.9	11.9	41.9	42.0	42.4
Total Machine Tools Yearly Avg.	45.7	43.2	40.6	42.3	42.2	42.3

p - Preliminary. r - Revised.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84," monthly issues and annual supplements.

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1941 to Date

Year	Metalworking Machinery Industry			Metal Cutting Machine Tool Industry		
	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
1941	NA	NA	NA	$ 44.22	51.6	$ .86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$ 1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.01	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.90	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.89	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979	329.30	43.5	7.57	344.21	44.3	7.77
1980	346.83	42.4	8.18	366.21	43.7	8.38
1981	371.90	41.6	8.94	383.95	42.1	9.12
1982	380.09	39.8	9.55	380.44	38.9	9.78
1983	399.67	40.7	9.82	386.49	39.0	9.91
1984	436.29	42.9	10.17	432.48	42.4	10.20
1985(r)	450.08	42.5	10.59	450.71	42.6	10.58
1986(r)	465.55	42.4	10.98	465.13	42.4	10.96
1987(p)	473.68	42.5	11.14	467.76	42.1	11.08

p - Preliminary. r - Revised. NA - Not Available.

Note: Earnings figures include overtime and premium pay.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84," monthly issues and annual supplements.

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1941 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1941	$ 33.56	NA	$ 42.68	NA	NA	$ 44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.34	61.33	59.23
1950	62.43	67.08	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.36	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.18	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979	290.90	305.98	372.37	351.05	329.30	344.21
1980	310.78	328.00	394.00	369.76	346.83	366.21
1981	343.31	360.33	450.72	425.80	371.90	383.95
1982	355.27	367.62	470.61	461.55	380.09	380.44
1983	382.17	386.78	525.66	486.98	399.67	386.49
1984	403.24	417.32	557.57	516.21	436.29	432.48
1985(r)	416.12	427.04	582.47	533.83	450.08	450.71
1986(r)	424.98	440.54	572.97	550.84	465.55	465.13
1987(p)	434.32	454.32	574.04	560.40	473.68	467.76

p - Preliminary. r - Revised. NA - Not Available.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84," monthly issues and annual summaries.

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1941 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1941	$ .80	NA	$ 1.04	NA	NA	$ .86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$ 1.34	1.47	$ 1.37	$ 1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.48	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	2.70	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.08	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978	6.58	6.78	8.50	7.54	7.02	7.20
1979	7.13	7.32	9.06	8.26	7.57	7.77
1980	7.75	8.00	9.85	9.28	8.18	8.38
1981	8.54	8.81	11.02	10.31	8.94	9.12
1982	9.04	9.26	11.62	11.23	9.55	9.78
1983	9.39	9.55	12.14	11.82	9.82	9.91
1984	9.74	9.96	12.73	12.32	10.17	10.20
1985(r)	10.10	10.29	13.39	12.62	10.59	10.58
1986(r)	10.29	10.59	13.45	12.87	10.98	10.96
1987(p)	10.45	10.77	13.57	13.19	11.14	11.08

p - Preliminary. r - Revised. NA - Not Available.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84," monthly issues and annual supplements.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

Region and Survey Year	Occupation				
	Machine Tool Operators, Production				
	Class A (b)	Class B (c)	Class C (d)	Numerically Controlled	Tool Room One Type Machine
1. Baltimore, Md.					
Jan. 1978	$ 6.74	$ 5.79	$ 5.24	$ 5.67	$ 6.54(e)
Jan. 1981	9.01	7.84	7.01	8.45	NA
Nov. 1983	10.65	9.61	7.83	10.25	NA
2. Boston, Mass.					
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.71	NA
Nov. 1983	10.99	10.16	NA	9.99	NA
3. Buffalo, N.Y.					
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.77
Nov. 1983	10.06	8.15	7.29	11.24	10.92
4. Chicago, Ill.					
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.68	11.12
Nov. 1983	11.50	9.28	8.39	11.03	12.63
5. Cleveland, Ohio					
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.41	9.68
Nov. 1983	10.15	8.92	7.10	10.40	10.67
6. Denver, Colo.					
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.61	10.68
Nov. 1983	10.41	7.92	5.83	10.26	11.32
7. Detroit, Mich.					
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.98	11.98
Nov. 1983	12.70	10.92	9.58	11.61	12.39
8. Houston, Tx.					
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	8.96	5.93	10.25	10.47
Nov. 1983	11.56	9.71	9.68	11.86	11.55
9. L.A.-Long Beach, Cal.					
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.39	4.83	9.79	9.70
Nov. 1983	12.71	8.38	NA	14.72	12.46
10. Milwaukee, Wis.					
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	10.63
Nov. 1983	11.71	11.37	10.22	12.06	11.89
11. Newark, N.J.					
Jan. 1978	6.50	6.59	4.85	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	9.25
Nov. 1983	9.83	9.38	5.31	10.54	10.45
12. Pittsburgh, Pa.					
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.38	NA
Nov. 1983	10.53	8.89	7.48	11.46	10.13
13. St. Louis, Mo.-Ill.					
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69
Nov. 1983	11.63	9.20	7.27	11.36	12.00

NA - Not Available.

(a) Nonelectrical Machinery (SIC 35).
(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.
(c) Operators who set up their own machines and maintain operation set-ups made by others.
(d) Operators who perform routine and repetitive operations but do not set up machines.
(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.						
	$ 6.03	$ 5.71	$ 6.72	NA	$ 5.13	$ 5.38
	8.00	6.88	8.88	$ 7.72	7.21	NA
	11.00	7.10	11.45	8.04	5.96	NA
2.						
	6.18	4.89	NA	5.26	4.56	5.73
	8.31	6.62	8.47	7.44	6.18	7.22
	9.14	7.24	10.01	8.53	6.54	9.26
3.						
	6.92	6.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
	10.36	10.27	10.95	9.54	8.66	8.36
4.						
	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
	11.01	8.93	11.54	10.11	8.35	10.15
5.						
	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
	11.02	7.43	10.99	9.09	8.90	10.13
6.						
	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
	9.53	7.05	9.82	NA	NA	NA
7.						
	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
	12.47	11.23	12.33	10.75	10.50	11.59
8.						
	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
	10.89	10.77	11.57	11.22	9.15	9.20
9.						
	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.24	5.74	6.93
	10.15	7.29	11.90	7.10	8.45	9.15
10.						
	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	10.05	10.45	9.91	9.24	10.12
	11.45	10.76	11.82	10.92	10.51	10.95
11.						
	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	7.82
	9.47	8.04	9.60	8.27	6.36	9.09
12.						
	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
	9.74	7.63	11.22	10.50	9.68	10.08
13.						
	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86
	11.49	8.73	10.58	9.44	8.05	9.22

NA - Not Available.

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.

(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.

(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.

(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Selected Years, 1937 to Date

Year	Machine Tool Total		Metal Cutting		Metal Forming	
	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,487	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,058	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112,200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977	83,100	53,300	59,400	37,200	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979	96,100	64,400	69,100	45,700	27,000	18,700
1980	99,700	66,000	72,800	47,800	26,900	18,200
1981	98,300	63,900	74,300	47,900	24,000	16,000
1982	77,800	46,000	58,300	33,900	19,500	12,100
1983	58,300	34,100	43,000	24,500	15,300	9,600
1984	58,500	35,200	42,400	24,700	16,100	10,500
1985(r)	60,500	36,400	42,800	24,900	17,700	11,500
1986(r)	55,200	32,700	38,600	22,000	16,600	10,700
1987E	50,400	29,900	35,300	20,100	15,100	9,800

NA - Not Available. E - Estimate by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufacturers" and "Annual Survey of Manufacturers."

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years, 1960 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1970	100,200	965.3	65,900	136.6	572.6
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977	83,100	1,309.7	53,300	109.1	760.1
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7
1981	98,300	2,129.8	63,900	129.3	1,259.0
1982	77,800	1,773.1	46,000	86.8	954.5
1983	58,300	1,354.1	34,100	63.7	708.1
1984	58,500	1,460.9	35,200	67.2	784.4
1985	60,500	1,589.2	36,400	70.7	868.0
1986	55,200	1,529.3	32,700	65.0	814.3

Sources: U.S. Bureau of the Census, "Census of Manufacturers" and "Annual Survey of Manufacturers."

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years, 1960 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$152.1	17,952	35.8	$100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1970	28,900	280.6	20,100	43.4	177.3
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978	25,200	415.6	17,000	35.1	253.2
1979	27,000	485.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2
1981	24,000	496.8	16,000	30.8	294.9
1982	19,500	438.1	12,100	23.2	245.3
1983	15,300	357.0	9,600	17.8	196.0
1984	16,100	407.0	10,500	20.7	242.7
1985	17,700	461.6	11,500	23.0	275.4
1986	16,600	440.5	10,700	21.4	257.3

Sources: U.S. Bureau of the Census, "Census of Manufacturers" and "Annual Survey of Manufacturers."

EMPLOYMENT AND COMPENSATION

Metal Cutting Machine Tool Industry

1937 to Date

Year	All Employees		Production Workers		
	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	36,997	NA	62.5
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.6	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	486.8
1976	58,100	845.4	37,600	73.5	473.9
1977	59,400	949.0	37,200	76.3	540.7
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5
1981	74,300	1,633.0	47,900	98.5	964.1
1982	58,300	1,335.0	33,900	63.6	709.2
1983	43,000	997.1	24,500	45.9	512.1
1984	42,400	1,053.9	24,700	46.5	541.7
1985	42,800	1,127.6	24,900	47.7	592.6
1986	38,600	1,088.8	22,000	43.6	557.0

NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufacturers" and "Annual Survey of Manufacturers."

SELECTED LABOR RATIOS

1964 to Date

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod. Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1964	$ 7,645	68%	2,[illegible]96	$ 3.15	$12,844	59%	$ 8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,438	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,179	3.62	15,955	55	10.56
1968	8,958	68	2,090	3.85	16,336	55	11.46
1969	9,584	67	2,098	4.12	17,452	55	12.43
1970	9,603	64	2,035	4.24	15,597	62	11.93
1971	9,872	61	1,943	4.44	15,181	65	12.71
1972	10,930	64	2,042	4.78	17,175	64	13.22
1973	11,843	66	2,093	5.02	20,269	58	14.58
1974	13,452	68	2,107	5.51	24,877	54	17.48
1975	13,540	65	2,002	5.96	26,119	52	20.07
1976	14,551	64	1,955	6.45	28,642	51	22.64
1977	15,976	63	2,051	7.09	31,416	51	24.46
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980	20,659	66	2,067	9.00	46,005	45	33.90
1981	21,978	64	2,056	9.79	50,335	44	37.97
1982	22,899	58	1,876	11.15	43,160	53	39.56
1983	23,188	57	1,873	11.16	37,505	62	35.13
1984	24,856	58	1,883	11.65	42,925	58	39.14
1985	26,346	58	1,916	12.42	46,729	56	41.93
1986	28,207	57	1,982	12.78	47,249	60	41.83
METAL FORMING MACHINE TOOL INDUSTRY							
1964	$ 7,839	72%	2,269	$ 3.20	$13,847	56%	$ 8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,267	3.46	15,214	56	9.11
1967	8,548	72	2,211	3.57	14,973	57	9.46
1968	8,810	70	2,211	3.67	16,247	54	10.57
1969	9,664	69	2,186	4.06	16,182	60	10.69
1970	9,709	70	2,159	4.09	16,249	60	10.82
1971	9,898	66	2,056	4.33	14,914	66	11.06
1972	11,012	69	2,090	4.72	17,332	64	12.04
1973	11,985	70	2,212	4.91	20,241	59	13.07
1974	12,786	70	2,133	5.50	21,852	59	14.64
1975	13,196	68	2,023	5.82	23,781	55	17.27
1976	14,707	69	2,013	6.69	27,122	54	19.41
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	67	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	48	26.77
1980	19,112	68	1,934	8.90	38,740	49	29.61
1981	20,700	67	1,925	9.57	40,688	51	31.70
1982	22,467	62	1,917	10.57	39,887	56	33.53
1983	23,333	63	1,854	11.01	41,150	57	35.37
1984	25,280	65	1,971	11.72	48,193	52	37.48
1985	26,079	65	2,000	11.97	52,723	49	40.57
1986	26,536	64	2,000	12.02	46,127	58	35.78

Source: 1963, 1967, 1972, 1977, 1982: U.S. Bureau of the Census, "Census of Manufacturers," 1982, Industry Series: "Metalworking Machinery and Equipment," MC 82-1-35C and earlier years. Other Years: U.S. Bureau of the Census, "Annual Survey of Manufacturers."

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS

Selected Industry Groups, 1962 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Industry	Metalworking Machinery Industry
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979	3.3	3.5	4.0	5.7
1980	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1
1982	2.3	2.2	2.2	2.7
1983	3.0	3.0	2.7	3.3
1984	3.4	3.6	3.7	4.9
1985	3.3	3.5	3.4	4.6
1986	3.4	3.5	3.4	4.6
1987	3.7	3.8	4.0	4.7

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings," monthly issues and annual supplements.

WORK INJURY RATES

By Industry, 1986

	Incidence Rates (per 100 Employees)			
Industry	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	Average Lost Workdays Per Lost Workday Case
Manufacturing	10.6	4.7	5.9	18.1
Fabricated Metal Products	16.0	6.8	9.2	17.0
Metal Stampings	16.1	6.7	9.4	17.9
Machinery Except Electrical	10.7	4.2	6.5	17.1
Engines and Turbines	8.6	3.6	5.0	18.4
Construction and Related Machinery	13.7	5.6	8.1	18.2
Metalworking Machinery	12.1	4.0	8.1	17.3
Machine Tools, Metal Cutting Types	8.9	3.2	5.7	19.9
Machine Tools, Metal Forming Types	15.2	6.2	9.0	15.7
Special Industry Machinery	12.2	4.7	7.5	16.0
General Industrial Machinery	12.1	4.8	7.3	18.3
Transportation Equipment	9.6	4.1	5.4	19.3
Motor Vehicles and Equipment	10.2	4.4	5.8	18.7

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

HOURLY COMPENSATION COST FOR PRODUCTION WORKERS
NONELECTRICAL MACHINERY
(U.S. Dollars)

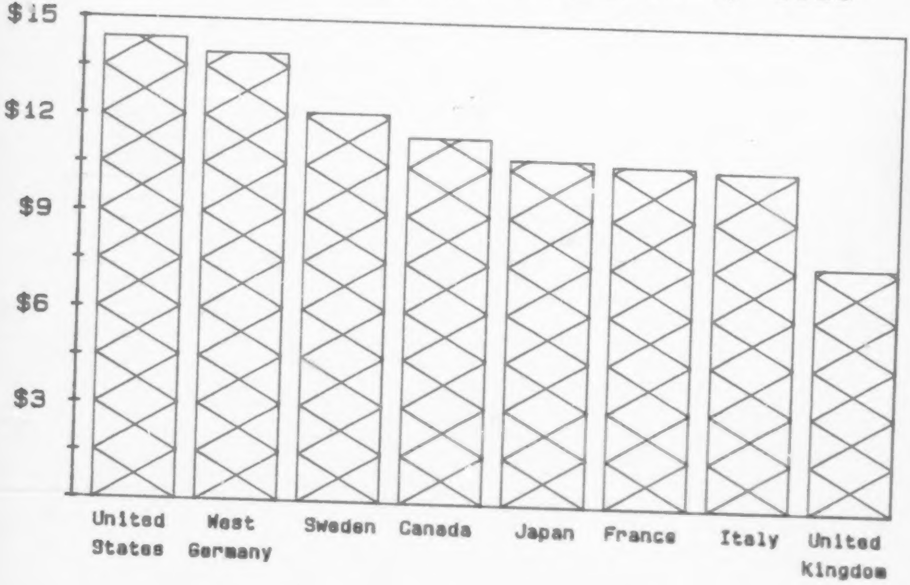
Country	1983	1984	1985	1986
United States	$13.08	$13.56	$13.97	$14.38
Canada	12.07	11.90	11.27	11.43
Mexico (a)	2.25	2.25	2.31	NA
Germany (Federal Republic)	10.60	9.71	9.99	13.93
Italy	7.93	7.58	7.89	10.57
France	8.16	7.67	7.86	10.69
United Kingdom	6.48	6.09	6.37	7.67
Switzerland (b)	10.90	9.99	9.92	NA
Japan	7.14	7.36	7.48	10.82
Taiwan	1.49	1.70	1.67	1.95
South Korea	1.44	1.60	1.58	1.64
MACHINE TOOL INDUSTRY				
United States	13.28	13.65	14.19	14.71
Japan	6.92	7.19	7.67	10.90

NA - Not Available.

(a) Includes farm machinery & tools and office & computing equipment.
(b) Includes primary metals, metal products and machinery and equipment.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons.

Average Hourly Compensation
of Production Workers
Machinery, Except Electrical, 1986



AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES
In Selected Countries, 1982 to Date
(U.S. Dollars)

Country	Industry	1982	1983	1984	1985(r)	1986	Percent Change 1982–86
Canada	(1)	$8.75	$9.13(b)	$8.82	$ 8.39	$ 8.71	−0.5%
France	(1)	4.88	4.68	4.32	NA	NA	NA
Italy	(1)	4.99	NA	NA	NA	NA	NA
Japan	(1)	6.84	7.27	7.51	7.67	10.92	59.6
Switzerland (a)	(2)	8.38	8.40	7.69	7.58	10.90	30.1
United Kingdom	(1)	5.50	5.02	4.73	5.00	6.02	9.5
United States	(1)	9.26	9.55	9.96	10.29	10.59	14.4
West Germany	(1)	6.32	6.21	5.72	5.84	8.22	30.1

r - Revised. NA - Not Available.

(a) Men only.
(b) Ten month average.
(1)—Machinery, except electrical.
(2)—Basic metal and fabricated metal products.

Sources: "ILO 1986 Statistical Yearbook" ("Statistics of average earnings . . . usually cover cash payments received from employers, i.e., remuneration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums . . .").

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS
In Selected Industry Groups, 1986 (a)
(U.S. Dollars)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$13.21	$14.38	$13.26	$19.88
Canada	11.04	11.43	10.29	13.45
France	10.27	10.69	10.18	11.22
West Germany	13.35	13.93	12.82	16.91
Italy	10.01	10.57	9.99	10.55
Japan	9.47	10.82	8.41	11.97(b)
Sweden	12.43	12.13	11.97	12.75
United Kingdom	7.50	7.67	6.96	8.66

(a) Preliminary estimates.
(b) Includes motorcycle manufacturing.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

8

FINANCE

Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite figures are based on a weighted average of individual company data. Prior to 1980, six companies formed the basis of the composite. Since 1980, only five firms have been included. However, since the figures presented are weighted according to the total market value of equity stock outstanding in these firms, comparisons between data before and after 1980 should prove valid.

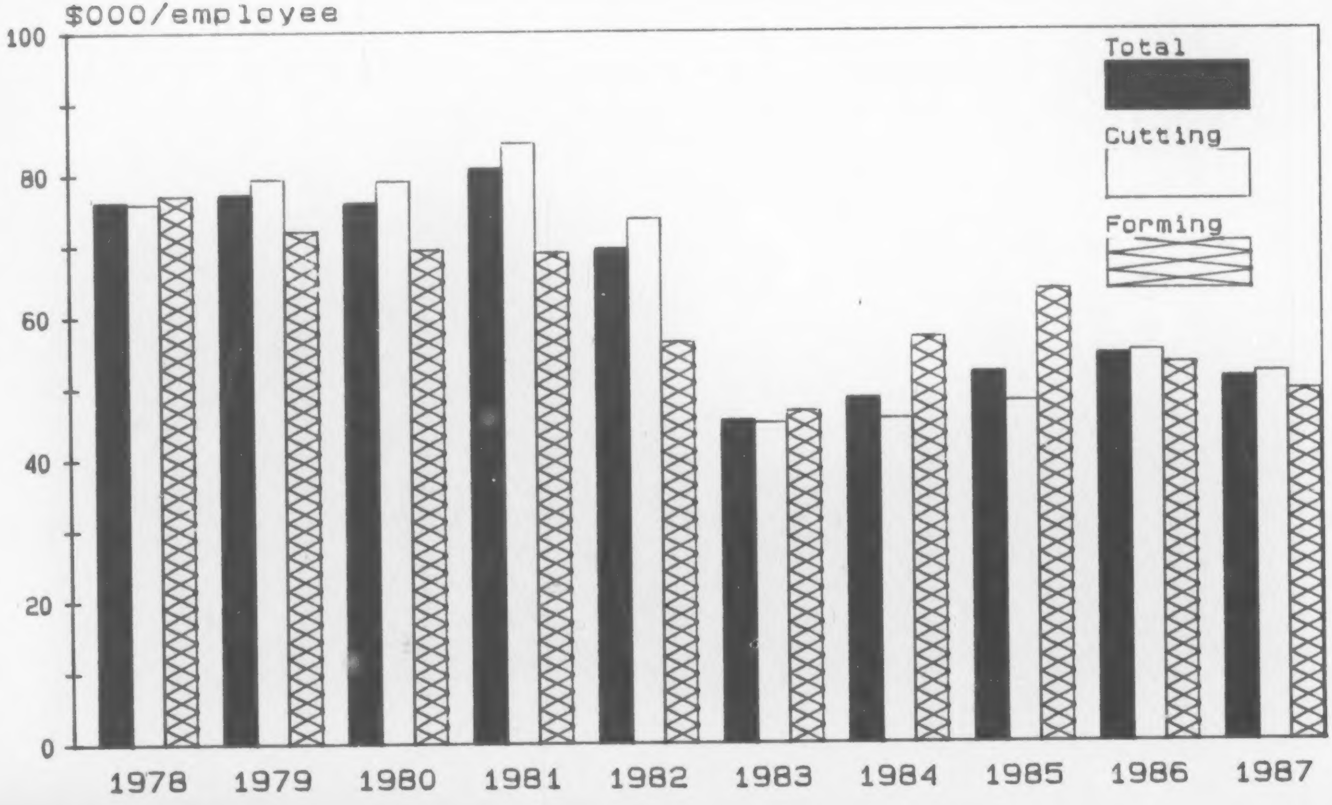
Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941–1943 = 10 to 1982 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, an inflationary environment leads to the overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.

Machine Tool Industry Productivity

(Constant $1982 Shipments per Production Worker)



SELECTED FINANCIAL RATIOS FOR CORPORATIONS (a)
IN SELECTED INDUSTRIES, 1987

Industry	% Net Operating Profit on Sales	% Earnings After Taxes On Sales	% Earnings After Taxes On Net Worth	% Depreciation and Amortization On Net Sales	Times Inventory Turnover	Current Assets to Current Liablities
Machine Tools	2.1%	1.0%	2.2%	2.9%	3.3	2.0
All Manufacturing Corporations	6.6	4.8	12.8	4.1	6.9	1.5
Durable Manufactures	5.7	4.5	11.9	3.8	5.7	1.6
Electrical Machinery	5.5	4.3	10.1	3.7	5.2	1.6
Machinery, Except Electrical	5.3	4.9	9.3	4.4	5.2	1.8
Motor Vehicles	4.6	5.3	16.9	4.2	12.3	1.5
Chemical and Allied Products	8.6	7.5	15.9	4.4	6.8	1.4

(a) Excludes corporations with less than $250,000 in assets, except for "Machine Tools."

Source: U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)
Machine Tool Industry, 1968 to Date
(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1968	$1,161	$ 845	$253	$ 592	$316	$ 94	$222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977	1,498	1,044	310	734	454	133	321
1978	1,698	1,180	340	840	518	145	373
1979	1,892	1,336	383	953	556	155	401
1980	2,052	1,469	416	1,053	583	164	420
1981	2,324	1,599	449	1,150	725	205	520
1982	2,435	1,692	475	1,217	743	203	541
1983	2,316	1,677	472	1,205	639	176	464
1984	2,233	1,638	467	1,171	595	165	430
1985	2,289	1,632	461	1,172	657	181	476
1986	(b)	(b)	(b)	(b)	(b)	(b)	(b)

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

(b) Data was not collected in 1986.

Source: U.S. Bureau of the Census, "Census of Manufacturers," 1967, 1972, 1977, 1982; U.S. Bureau of the Census, "Annual Survey of Manufacturers."

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1954	NA	$ 37.7	$11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.8	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9
1981	296.2	233.2	52.3	180.9	63.0	12.8	50.2
1982	190.3	152.2	32.8	119.4	38.1	4.3	33.8
1983	132.9	104.8	18.6	86.2	28.1	4.6	23.5
1984	139.8	108.8	19.2	89.7	31.0	3.8	27.3
1985	135.3	91.6	14.6	77.0	43.7	9.3	34.4
1986	96.6	62.7	13.3	49.4	33.9	5.1	28.8

NA - Not Available.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

NOTE: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufacturers," 1963, 1967, 1972, 1977, 1982; U.S. Bureau of the Census, "Annual Survey of Manufacturers."

MACHINE TOOL FINANCIAL INDICATORS (a)

Per Share Data

(1982 = 100)

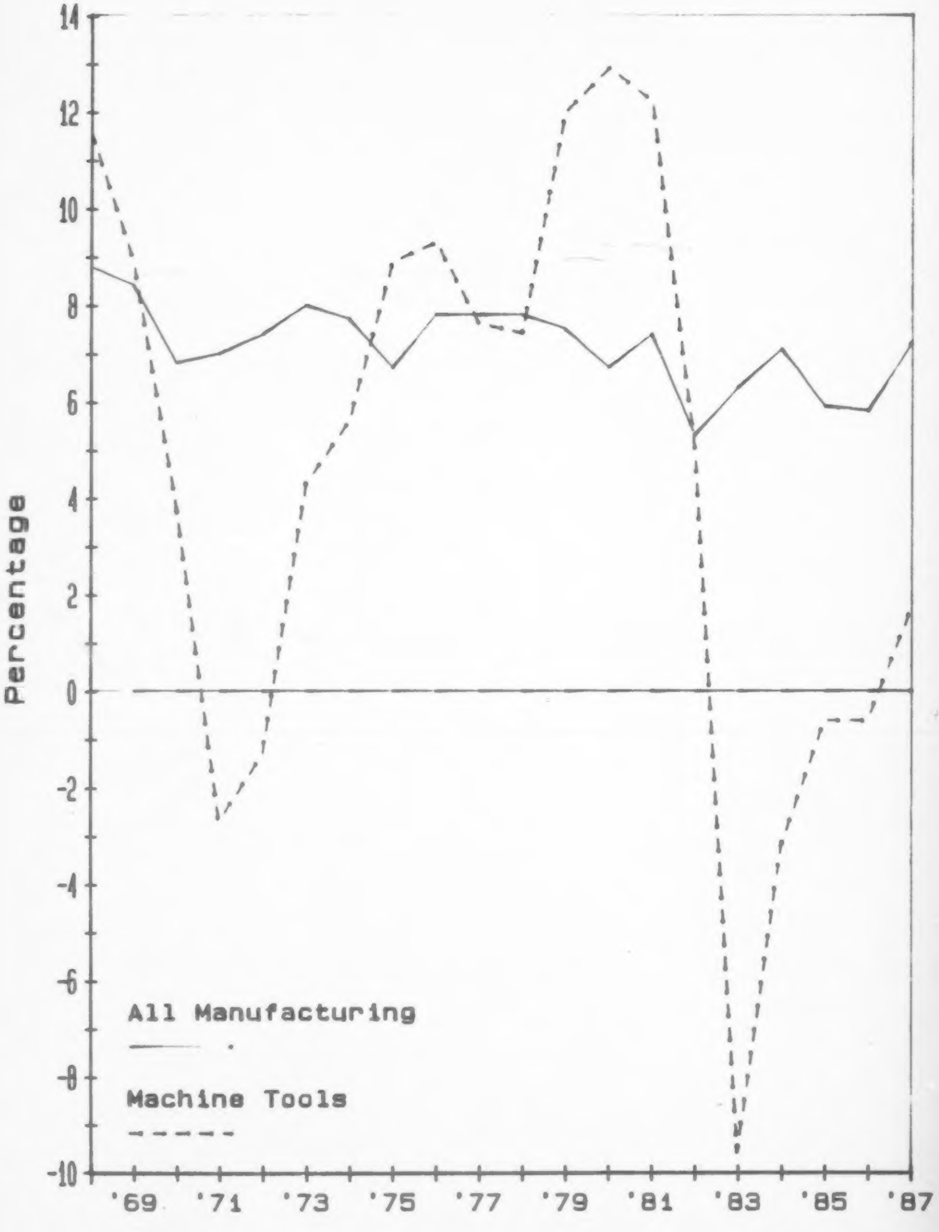
Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	22.9	31.8	13.7	24.8	23.3	16.8
1957	21.2	25.7	15.2	26.0	24.7	12.4
1958	13.3	7.2	15.7	25.5	24.5	9.5
1959	14.5	7.6	16.1	24.9	23.7	7.9
1960	17.1	12.8	16.9	24.9	22.9	11.3
1961	16.9	14.1	16.8	25.2	23.5	8.4
1962	18.6	13.7	15.2	25.6	24.4	8.3
1963	19.3	17.9	17.3	26.4	25.1	11.4
1964	20.3	27.5	19.7	24.6	23.0	17.6
1965	24.1	33.8	22.0	26.9	28.6	19.1
1966	29.0	42.8	25.2	29.7	32.0	26.3
1967	31.2	48.2	29.9	33.0	34.8	18.5
1968	30.9	48.4	35.1	35.2	35.4	31.0
1969	31.4	42.3	35.6	36.3	36.0	29.0
1970	28.0	20.5	36.1	36.3	37.5	22.6
1971	22.9	7.8	33.7	35.6	35.5	17.4
1972	27.6	15.5	33.4	35.0	36.4	27.8
1973	37.3	35.3	34.7	36.8	37.4	40.3
1974	45.3	39.3	37.2	38.4	53.3	45.8
1975	48.9	39.9	40.9	39.7	55.5	32.6
1976	45.9	38.1	42.6	41.1	53.6	28.9
1977	52.2	55.2	45.4	43.7	55.0	38.6
1978	61.7	79.8	47.0	49.2	59.1	45.9
1979	74.2	113.1	53.2	58.6	66.1	68.7
1980	96.6	134.1	65.3	74.8	91.6	100.3
1981	103.4	137.2	77.4	84.0	94.6	90.5
1982	100.0	100.0	100.0	100.0	100.0	100.0
1983	62.6	2.6	108.2	89.8	89.2	59.5
1984	74.0	39.5	106.6	90.2	86.9	94.7
1985	86.9	54.2	119.6	84.6	89.4	79.4

(a) Data in this table prior to 1980 represents a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time. Since 1980, the composite has included five companies. However, since the indicators are weighted according to the market value of shares outstanding, a shift in the composite's composition should not affect the indicators. Therefore, pre- and post-1980 data are comparable.

Source: Standard & Poor's Corporation, Data in original form, 1941-43 equals 10, taken from "Industry Surveys," a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.

Net Income Before Taxes as a Percent of Sales

All Manufacturing & Machine Tools
1968 to Date



AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

1967 to Date

Year	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
	All Manufacturers	Machine Tool Manufacturers	All Manufacturers	Machine Tool Manufacturers
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.7	12.9	9.5	19.4
1981	7.4	12.2	10.5	18.0
1982	5.3	5.0	6.7	6.1
1983	6.3	(9.6)	7.9	(8.7)
1984	7.1	(3.2)	8.9	(3.4)
1985	5.9	(0.6)	7.1	(0.7)
1986	5.8	(0.6)	6.5	(b)
1987(a)	7.2(c)	1.7	8.0(c)	2.1

(a) Data based on the machine tool activities of 94 companies and divisions.
(b) Net income before taxes was less than 0.1%.
(c) Excludes corporations with less than $250,000 in assets.

Note: Figures in parentheses represent negative figures.

Sources: U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

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Domestic Distributors Directory

The Domestic Distributors Directory is designed to apprise machine tool builders of distribution sources within the industry—field sales offices, distributors, agents and manufacturers' representatives. This publication contains a complete listing of domestic distributors of machine tools.

Copies of the Domestic Distributors Directory are available from the Publications Order Clerk at NMTBA. This publication costs $25.00 for members, and $30.00 for non-members.

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The U.S. Machine Tool Directory contains a complete cross-referenced listing of all NMTBA members and the products they manufacture. This publication is divided into three parts. Part I is a foreign language index. The second part of this directory lists specific product types, the NMTBA member companies which manufacture these products, and includes a brief description of the product.

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9

MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years - a total of 13 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

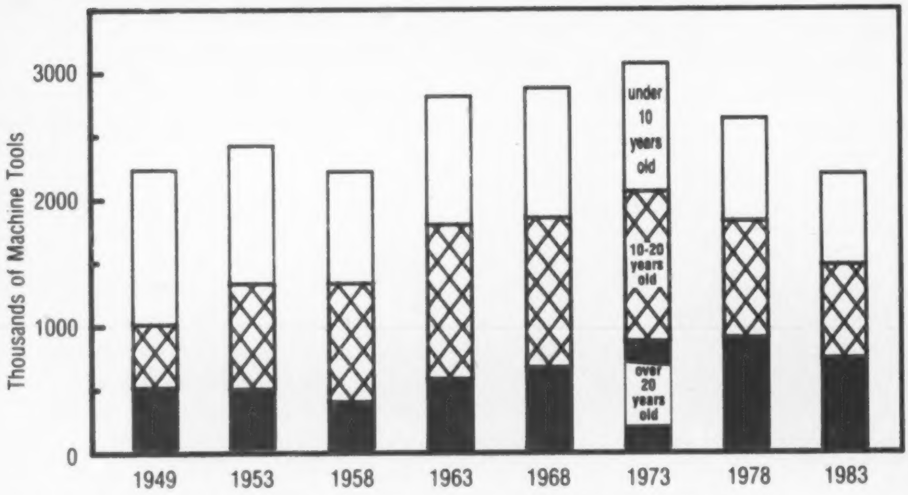
Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. The latest Inventory, the 13th of the series, returned to the format employed in the first eleven, i.e. surveying all metalworking industries in one year. The 13th Inventory was conducted in 1983 and its results were published late in the year. All of the tables and charts in this chapter have been updated to reflect this latest compilation.

The American Machinist Inventory is based on a sample survey and it is the nature of such surveys that the reliability of the data is greatest in the broader categories. The survey's reliability necessarily decreases as results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas." Another limitation is the coverage of the survey. While the data compiled are believed to accurately reflect the number and types of machine tools in use in U.S. metalworking industries, the user should be aware of the sample's limitations. For all but the 12th Inventory, all of metalworking manufacturing was surveyed to arrive at tabulated results. In the 12th Inventory, estimates were made for metalworking plants with fewer than twenty employees as these establishments were not surveyed. Tables containing these estimates are so noted. Secondly, the coverage of the survey is based on employment totals, not the number of plants. For example, in the 1983 Inventory, the number of plants responding to the survey comprised only 7% of the total number of establishments with more than twenty employees recognized by the U.S. Bureau of Census. However, this 7% represented an employee base of approximately 25% of metalworking employment. This level of representation bolsters the survey's reliability.

Also included in this chapter is a chart of Inventory data showing the number of machine tools in use in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

Additional information concerning the American Machinist Inventory may be obtained from American Machinist & Automated Manufacturing, 122 East 42nd Street, Suite 2119, New York, New York 10168.

Machine Tools in Use in Metalworking Industries



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1983

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	2,896,754	2,247,833	648,921
Metalworking Industries (a)	2,192,754	1,702,833	489,921
Other Industries	380,000	275,000	105,000
Training	74,000	70,000	4,000
In Storage and Surplus	250,000	200,000	50,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precisioninstruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE
Metalworking Industries, 1963 to 1983
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10–19 Years		Over 20 Years			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	28.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (a, b)									
All Metalworking	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.9	3.1
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
1983 (b)									
All Metalworking	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Non-Electrical Machy.	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machy.	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.

Source: McGraw Hill, Inc. "American Machinist," Inventories of Metalworking Equipment, 1963 - 1983.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS
By Number and Age
(Number in Thousands)

			Percent of Total		
Country	Year	Total	Under 10 Years	10–19 Years	20 Years & Up
United States	1983	2,193	32.7%	34.0%	33.2%
West Germany (a)	1980	1,250	34.0	18.0	48.0
United Kingdom (b)	1982	775	42.3	30.5	27.2
Japan(c)	1981	918	36.4	28.0	35.6
France	1980	761	35.0	33.0	32.0
Italy (d)	1975	541	38.1	33.9	28.0
Canada	1978	211	35.8	30.4	33.8

(a) Machine tool age classifications are as follows: Under 10 Years, 10 to 14 Years, 15 Years & Up.
(b) Machine tool age classifications are as follows: Under 6 Years, 6 to 19 Years, 20 Years & Up.
(c) Machine tool age classifications are as follows: Under 8 Years, 8 to 12 Years, 20 Years & Up.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist."

MACHINE TOOLS IN USE
Metalworking Industries, 1983
(Number in Thousands and Percent of Industry Total)

		By Age						With Numerical Control	
		Under 10 Years		10–19 Years		20 Years and Over			
Industry	Total	Number	%	Number	%	Number	%	Number	%
TOTAL	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Metal Furniture, Fixtures	26.6	6.9	26.0	11.3	42.3	8.4	31.7	0.6	2.3
Primary Metals	117.8	34.4	29.2	39.6	33.6	43.8	37.2	2.7	2.3
Fabricated Metal Products	518.9	149.4	28.8	179.3	34.5	190.3	36.7	14.5	2.8
Fab. Structural Metal Product	120.3	41.7	34.7	42.1	35.0	36.5	30.3	4.3	3.6
Screw Machine Products	85.7	21.6	25.2	31.3	36.5	32.8	38.3	1.4	1.6
Metal Stampings	96.2	23.6	24.6	32.3	33.6	40.3	41.9	1.9	1.9
Other Fab. Metal Products	216.8	62.4	28.8	73.6	33.9	80.8	37.3	6.9	3.2
Non-Electrical Machinery	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machinery	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9
Special Industry Machy.	80.4	24.1	29.9	27.1	33.8	29.2	36.3	4.0	5.0
General Industrial Machy.	110.0	31.9	29.0	39.5	35.9	38.6	35.1	5.8	5.3
Other Non-Elec. Machy.	412.9	155.3	37.6	137.6	33.3	120.0	29.1	30.9	7.5
Electrical Machinery	245.7	85.3	34.7	90.9	37.0	69.4	28.3	10.8	4.4
Elec. Industrial Apparatus	41.4	13.8	33.2	15.0	36.3	12.6	30.5	1.8	4.3
Communications Equipment	36.6	14.0	38.4	13.6	37.1	9.0	24.5	2.6	7.1
Other Elec. Machinery	167.7	57.5	34.3	62.3	37.2	47.8	28.5	6.4	3.8
Transportation Equipment	303.0	89.0	29.4	92.7	30.6	121.2	40.0	15.3	5.0
Motor Vehicles Equip.	153.2	38.9	25.4	46.8	30.5	67.6	44.1	4.1	2.7
Aircraft and Parts	97.7	34.2	35.0	33.3	34.1	30.2	30.9	8.8	9.0
Other Trans. Equip.	52.0	15.9	30.6	12.6	24.2	23.5	45.2	2.4	4.6
Precision Instruments	109.6	41.3	37.7	40.0	36.5	28.3	25.8	4.9	4.4
Misc. Mfg. Industries	65.9	26.2	39.7	20.2	30.7	19.5	29.6	2.1	3.2

Note: Individual items may not add to totals due to rounding.

Source: American Machinist, "The 13th American Machinist Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major User Industry, 1983
(Number in Thousands)

	Total Machine Tools		Metal Cutting Machines		Metal Forming Machines	
Using Industry	Number	%	Number	% Under 10 Yrs. Old	Number	% Under 10 Yrs. Old
TOTAL	2,192.8	100.0%	1,702.8	34%	489.9	27%
Furniture & Fixtures	26.6	1.2%	10.8	34%	15.9	21%
Primary Metals Industries	117.8	5.4	88.5	30	29.3	29
Fabricated Metal Products	518.9	23.7	326.0	32	192.9	25
Ordnance & Accessories	24.3	1.1	20.7	20	3.7	18
Non-Electrical Machinery	805.3	36.7	714.8	36	90.5	30
Electrical Machy. & Equipment	245.7	11.2	177.9	36	67.7	31
Transportation Equipment	303.0	13.8	248.6	30	54.4	27
Precision Instruments	109.6	5.0	91.3	38	18.3	33
Miscellaneous Mfg. Industries	65.9	3.0	45.0	47	20.9	23

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1983

(By Number and Age Distribution)

	Metal Cutting Machines					Metal Forming Machines					No. Units with NC		% Plants with NC		
Region and Area	Total Units	0–4 Years	5–9 Years	10–19 Years	20 Years & Over	Total Units	0–4 Years	5–9 Years	10–19 Years	20 Years & Over	Cutting	Forming	Turning	Mach. ctrs.	Punching
U.S.A.	1,702,833	14%	20%	34%	32%	489,921	9%	18%	36%	37%	94,012	9,296	26%	19%	8%
NORTHEAST															
Boston	101,472	15%	21%	33%	32%	27,531	9%	18%	34%	39%	5,641	504	28%	20%	8%
Bridgeport-Hartford	67,581	14	18	34	34	16,389	9	17	36	39	3,893	197	28	24	3
New York-Newark	120,299	15	22	35	28	38,954	10	18	37	35	6,707	936	18	16	6
Buffalo-Syracuse	49,202	12	18	33	37	11,713	9	17	34	41	2,375	154	31	23	10
Philadelphia-Camden	77,535	14	21	34	32	25,286	9	18	35	37	4,057	490	28	19	8
Pittsburgh-Wheeling	47,239	12	20	33	35	13,634	7	16	33	44	2,390	192	31	23	7
SOUTHEAST															
Baltimore	14,065	13	20	34	34	4,212	8	18	35	39	592	86	23	14	14
Richmond	61,169	14	19	35	32	17,231	9	18	38	35	3,340	352	32	23	11
Atlanta-New Orleans	112,738	15	20	33	32	36,520	10	18	36	35	6,362	866	22	13	8
MIDWEST															
Cleveland	75,272	13	19	34	34	21,717	8	17	35	40	3,827	269	27	18	5
Toledo	21,624	10	17	32	40	6,632	7	15	36	42	841	55	27	18	10
Cincinnati-Louisville	57,956	13	19	34	35	16,496	8	16	37	39	2,868	241	29	22	9
Detroit	106,983	13	18	32	37	27,936	8	16	34	42	5,134	319	24	18	3
Indianapolis	45,936	12	18	34	36	14,234	8	16	34	41	1,920	190	28	13	5
Chicago	218,646	13	20	34	32	66,100	9	18	36	37	12,336	1,333	23	16	9
Milwaukee	60,777	12	19	34	35	15,879	8	18	36	38	3,210	260	26	21	9
Minneapolis-St. Paul	34,421	13	21	35	31	9,613	9	18	37	36	1,703	189	31	21	11
St. Louis	49,624	13	20	35	33	18,373	9	17	37	37	1,979	295	21	14	10
SOUTHWEST															
Kansas City - Tulsa	41,236	16	21	32	31	10,470	10	19	35	36	2,677	220	39	27	10
Dallas-Houston	79,137	18	21	31	30	19,848	12	19	35	34	6,110	473	35	20	7
MOUNTAIN AND PACIFIC															
Denver	32,341	15	22	33	30	8,829	10	19	35	36	1,742	238	23	18	12
Seattle-Portland	27,619	15	22	33	31	6,936	11	19	36	34	1,388	155	20	17	6
San Francisco	44,650	16	21	33	29	11,817	11	19	37	33	2,504	292	18	16	9
Los Angeles	155,311	17	22	34	28	41,571	11	19	37	33	10,416	990	28	21	7

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

By Major Type and Age, 1983

Type of Machine Tool	Plants With	Total Units	Change Since '78	Percent of Total	0–4 Years	5–9 Years	10–19 Years	20 Years and Over
GRAND TOTAL	—	2,192,754	−8%	100.0%	13%	20%	34%	33%
Non-NC Grinding Machines	75%	383,027	0%	17.5%	14%	22%	34%	31%
Non-NC Turning Machines	77	332,327	−14	15.2	10	16	35	40
Non-NC Drilling Machines	74	281,453	−18	12.8	10	18	36	36
Non-NC Milling Machines	74	218,479	−5	10.0	12	20	36	32
Mechanical Presses	43	198,973	−15	9.1	6	14	36	45
Cutoff & Sawing Machines	86	169,107	5	7.7	17	28	33	22
Non-NC Bending & Forming	41	77,285	2	3.5	11	19	38	32
Non-NC Punching & Shearing	41	66,363	9	3.0	11	20	37	32
Hydraulic Presses	38	53,292	−5	2.4	14	22	34	30
Honing, Lapping, Polishing	33	50,626	NA	2.3	12	23	35	30
Non-NC Boring Machines	28	40,462	−17	1.8	8	11	34	47
Gear-cutting & -finishing	10	34,834	−11	1.6	7	11	32	50
NC Turning Machines	26	33,352	236	1.5	58	28	11	3
Tapping Machines	24	28,139	1	1.3	13	25	36	26
Machining Centers	19	24,003	26	1.1	58	26	15	1
Forging Machines	6	19,613	−4	0.9	6	11	30	54
Pneumatic Presses	8	17,656	NA	0.8	18	30	37	16
Broaching Machines	18	16,505	20	0.8	11	15	29	45
NC Milling Machines	16	15,929	209	0.7	44	27	22	6
Station-Type Machines	5	13,588	−25	0.6	16	20	32	31
Electrical-Machining Units	14	12,434	9	0.6	31	28	35	6
Other Non-NC Metal Cutting	4	12,075	NA	0.6	12	18	37	34
Threading Machines	13	11,703	−5	0.5	8	17	37	38
Other Non-NC Metalforming	3	11,255	−67	0.5	6	18	36	40
Coil-Processing Systems	6	10,852	−78	0.5	13	25	35	27
Thread-Rolling Machines	5	8,604	36	0.4	9	17	31	43
Diecasting Machines	2	8,095	−21	0.4	12	24	44	20
NC Drilling Machines	9	7,993	134	0.4	21	29	43	8
Multiple-Side Forming Mach.	2	7,003	−45	0.3	7	21	35	38
NC Punching & Shearing	8	6,223	277	0.3	37	29	26	8
Non-NC Thermal Cutting	8	5,302	−61	0.2	28	33	26	14
NC Boring Machines	7	5,064	68	0.2	29	22	33	17
Other NC Metalcutting	2	3,121	652	0.1	19	25	13	43
NC Bending & Forming	3	2,585	21	0.1	33	26	27	15
NC Grinding Machines	3	2,276	734	0.1	50	21	22	7
Sheet-, Plate-processing	2	1,634	NA	0.1	15	25	24	37
NC Thermal Cutting	3	1,034	NA	0.1	53	29	8	9
Other NC Metalforming	(a)	488	75	(b)	47	18	22	14

NA - Not Available.

(a) Percentage is less than 1%.
(b) Percentage is less than 0.1%.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

Number by Type of Machine and User Industry, 1983

Using Industry	Metal Cutting						Metal Forming Total
	Total	Turn	Bore	Drill	Mill	Machining Centers	
TOTAL	94,012	33,352	5,064	7,993	15,929	24,003	9,296
Metal Furniture and Fixtures	253	46	19	58	43	23	357
Primary Metals Industries	2,413	842	271	261	433	353	249
Fabricated Metal Products	10,841	4,348	500	1,121	1,676	1,652	3,622
Ordnance and Accessories	797	NA	NA	NA	NA	NA	16
Non-Electrical Machinery	50,698	18,592	2,935	4,205	7,876	13,917	1,843
Metalworking Machinery	11,713	2,716	858	1,136	2,410	3,005	85
Machine Tools	3,373	956	355	400	355	1,103	31
Special Industry Machinery	3,903	1,115	219	559	563	1,314	134
Electrical Machinery and Equipment	9,415	2,677	182	1,150	1,983	2,644	1,357
Transportation Equipment	14,397	4,922	907	718	2,145	4,127	887
Aircraft Engines and Parts	8,450	2,790	426	336	1,692	2,810	332
Precision Instruments	4,434	1,538	110	227	1,132	1,240	440
Miscellaneous Manufacturing Industries	1,561	387	140	253	641	47	541

NA - Not Available.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

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Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System
BEA — Bureau of Economic Analysis
BLS — Bureau of Labor Statistics
BTN — Brussels Tariff Nomenclature
CCC — Customs Co-Operation Council
CECIMO — Comité Européen de Coopération des Industries de la Machine Outil
C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.
D — Withheld to avoid disclosing figures for individual companies
E — Estimate
EEC — European Economic Community
F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.
F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.
FTC — Federal Trade Commission
GNP — Gross National Product
ILO — International Labor Organization
ITC — International Trade Commission
NA — Not Available
NC — Numerically Controlled
NEC — Not Elsewhere Classified
NMTBA — National Machine Tool Builders' Association
P — Preliminary
R — Revised
S — Estimate did not meet Publication Standards
SEC — Securities and Exchange Commission
S.I.C. — Standard Industrial Classification
SITC — Standard International Trade Classification of the United Nations
TSUSA — Tariff Schedules of the U.S., Annotated
U.N. — United Nations
VDMA — Verein Deutscher Maschinenbauanstalten
VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA
Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS
........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS
........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET
........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS
........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS
........See EARNINGS

AVERAGE WEEKLY HOURS
........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS
........See EARNINGS

BACKLOG
........See ORDERS, UNFILLED

CANCELLATIONS
........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION
........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES
........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES
........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION
........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY
........Supplementary compensation statistics fall into two broad categories and are intended to capture

payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 24, 25, and 32 through 38. All other manufacturing major industry groups in SIC Codes 20 through 38 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

..........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

..........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics, Non-production bonuses are excluded.

.........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies, according to the Standard Industrial Classification, comprises SIC Industry Groups:

..........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

.........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other changes to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, Italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products.

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.

........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE

........See EXPORTS; IMPORTS

FRINGE BENEFITS

........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY

........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT

........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS

........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT

........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS

........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID

........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY

........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME

........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY

........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR

........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS
........See EXPORTS

MANUFACTURERS' NEW ORDERS
........See ORDERS

MANUFACTURERS' SHIPMENTS
........See SHIPMENTS

MARKET CATEGORY
........Major User Categories are classified either by Industry Group or by Market Category.
........See MAJOR USERS, DEFENSE, and MACHINERY AND EOUIPMENT INDUSTRIES

MARKET SHARE:
........Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF
........"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

........Cost of materials includes:
........the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
........the amount paid for electric energy purchased;
........the amount paid for all fuels consumed for heat, power, or the generation of electricity;
........the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
........the cost of products bought and resold in the same condition.
....cost of materials excludes the cost of services used, such as,
....advertising, insurance, telephone, etc.;
........research development, and consulting services;
........overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
........expense items chargeable to fixed asset accounts.

METAL FORMING
........See MACHINE TOOLS

METAL CUTTING
........See MACHINE TOOLS

METALWORKING INDUSTRY
........Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,
........3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devices
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY
........Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.
3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC
........See NUMERICAL CONTROLS

NET ASSETS
........See ASSETS, NET

NET INCOME
........See INCOME

NET NEW ORDERS
........See ORDERS

NET OPERATING PROFIT
........See INCOME

NET PROFIT ON SALES
........See INCOME

NET SALES
........See SALES

NEW HIRES
........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY
........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,

........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS
........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT
........See INCOME, NET OPERATING

ORDERS
........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS

........NEW ORDERS, NET,

....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS

....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS

........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS

....The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th Inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index, The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry—SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,

2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;

2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.
........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

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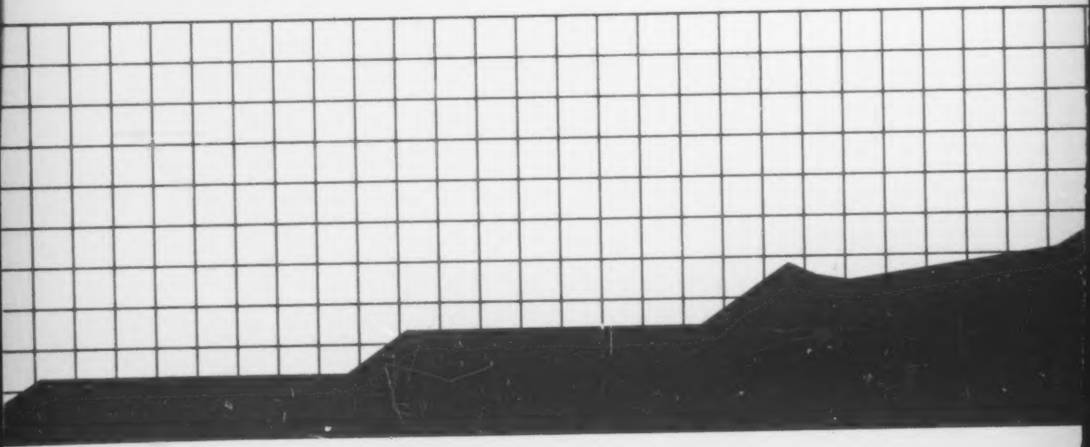

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